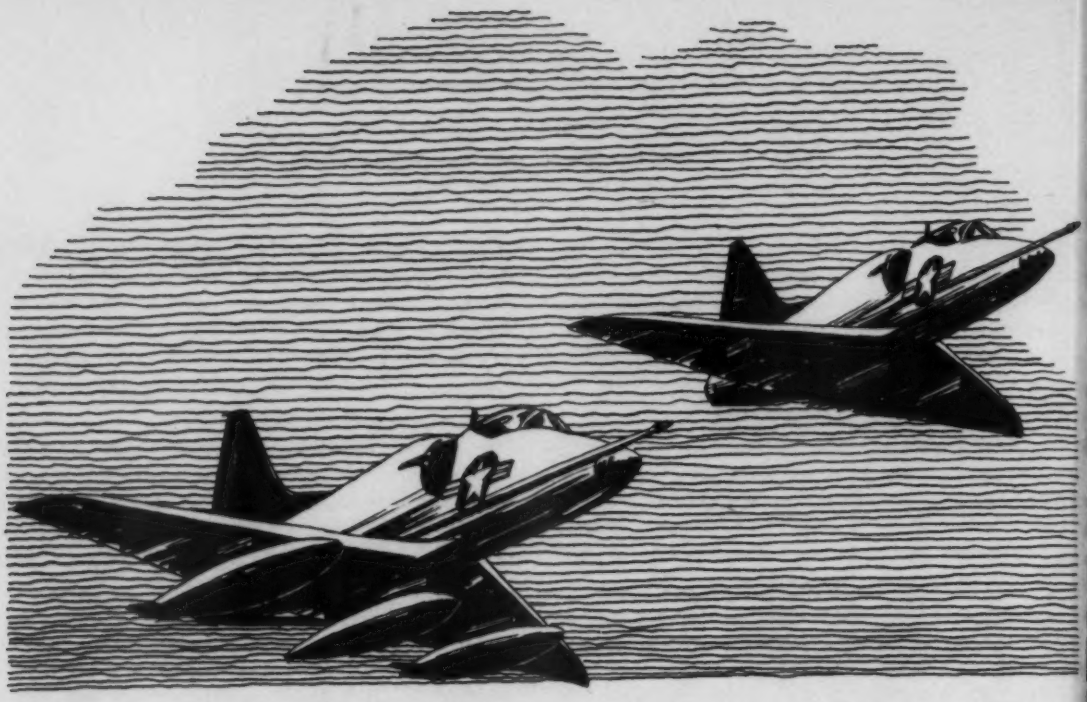
Naval Safety Center Publication

approach

JANUARY 1972 THE NAVAL AVIATION SAFETY REVIEW



other would lead the NORDO in on a section approach. This plan was communicated to the controlling agency.

Because the formation leader had no external stores (and therefore less fuel), it was agreed that he should be the one to break off for an individual approach. The flight leader would then take the NORDO aircraft on his wing. The only thing wrong with this plan was the fact that there was no way of communicating the details to the NORDO. Complicating the situation was the fact that the flight was now in solid IFR conditions.

As the descent continued, both wingmen began to experience vertigo. This was probably due in part to the fact that the lead aircraft had his white fuselage lights on bright and flashing. At the request of the flight leader the formation leader turned his lights to steady, but both wingmen's vertigo persisted.

Passing FL 180, approach control directed the lead aircraft to turn left, away from the formation (according to the plan previously formulated) and proceed as a solo for an individual approach. The flight leader in the left wing position, still experiencing vertigo, became concerned that the lead aircraft might turn into him. He also belatedly recognized that whatever the lead aircraft did, the NORDO would probably follow.

The crux of the matter was that no reasonable method existed, whereby the flight leader could get the NORDO to join on his wing. He came to the conclusion that the best course of action was for *him* to leave the formation and allow the present formation leader to take the NORDO aircraft in for a landing. He, therefore, broadcast his intentions and turned left 30 degrees, separating from the formation. Thereafter, approach control handled the three planes as two separate elements.

Approach control vectored the NORDO section into position for the first approach. The plan was for the formation leader to bring the NORDO aircraft in, drop him off, then make another approach. Radar was requested to keep the pattern tight for the second approach because the section leader would be at minimum fuel.

In the meantime, the pilot of the NORDO aircraft was hanging in there and following events as best he could. He later stated:

"Lead had his white fuselage lights on flash – and this gave me vertigo. I started dumping fuel, but decided at 4500 lbs to stop until I knew I was sure of landing. The weather became very thick and only the tightest position kept me from losing the lead. The flashing lights soon went steady, then I noticed that No. 2 was gone from the formation.

"We entered a number of heavy thunderstorms and things seemed to be going to hell fast. Visibility was so poor that all I could see to maintain position was the glow of the lead's white lights. I assumed we were on a GCA because of the airspeed and altitude and dumped

to about 3100 lbs. Upon breaking out, the first thing I saw was the red lights on top of the emergency vehicles at the field.

"It was raining so hard that I turned on the wiper but it did nothing. My landing was made by flying the ball and watching the runway lights from the side. I estimate that I had 2800 lbs of fuel on landing. The runway had many large patches of standing water. At one time I noticed water coming up over the wing from the nosewheel. Braking action was poor at best, but I stopped before the end of the runway."

The formation leader, after dropping off the NORDO aircraft at the field, executed a missed approach and was vectored by GCA for another approach. Meanwhile, the flight leader was inbound on a GCA.

The flight leader's approach and landing were normal with touchdown near the GCA touchdown point. Upon landing, the pilot raised the flaps and attempted aerodynamic braking but could not get the nose up. At about 100 knots, light braking was commenced but was ineffective.

Further braking attempts as the airspeed decreased were equally ineffective. The pilot hesitated to drop his hook because he thought the other two aircraft were both still airborne and he did not want to foul the runway. Nevertheless, he eventually did drop his hook but only after he had passed the arresting gear. When it became evident to the pilot that the aircraft was going off the end of the runway, he secured the engine.

The aircraft continued off the runway, down a short paved drainage slope, over a gutter, across a narrow paved road, and a 30-foot-wide dirt strip before striking a chain link fence. At this point the nose landing gear collapsed and the aircraft came to rest. The pilot, uninjured, was assisted from the aircraft by a passing motorist.

The tower immediately closed the runway. Meanwhile, the formation leader was nearing the field on his second GCA approach. When he learned the runway was closed, he requested clearance to his alternate. However, GCA suggested another base, which was closer, and the pilot accepted. Following a successful GCA, he shut down with 1100 pounds of fuel remaining.

Readers, no doubt, will be able to recognize a number of errors on the part of the flight leader. The one which contributed most directly to the accident was his failure to lighten his fuel load prior to touchdown.

Although the pilot indicated after the accident that he was aware of the length of the usable runway and knew the runway was wet, he took no action to lighten the aircraft, *landing with an estimated 5000 lbs of fuel.* The NATOPS Flight Manual discusses wet runway landings and indicates, "burn and/or dump down as

much as practicable to reduce the optimum approach speed and minimize the stopping distance," as the first step.

The question arises, what is "practicable?" This must be determined by the pilot based on his knowledge of aircraft performance, landing distance requirements, usable runway, and existing circumstances such as distance to divert fields. Admittedly, this can be a difficult determination to make, but there is no doubt that it is the pilot's responsibility.

One of the factors which may have contributed to the pilot's assumption that he could safely stop the aircraft was a lack of specific braking action information prior to landing. His only indication that runway conditions were other than normal was his knowledge that "light rain" was reported. In point of fact, it was raining hard at the time, according to two witnesses.

So much for the direct cause of this accident. Let's turn now to the events which preceded the heavy weight landing. It is apparent that a contributing factor in this accident was the flight leader's inadequate evaluation of events as they unfolded during the flight.

First, there was the wingman's radio failure 15 minutes into the flight. The flight leader, at this time, might have ordered a return to homebase; however, there is no specific requirement to alter a flight plan in such a circumstance. Furthermore, the weather at destination was expected to be well above VFR minimums. Therefore, the flight leader's action in continuing the flight seems reasonable.

Unfortunately, Mother Nature chose this inopportune time to come up with a change of weather which could not be – or at least was not – foretold by t forecasters. This presented the flight leader with unexpected situation which called for fine judgment his part. In retrospect, he seems to have be overconfident, a fact which put him "behind the pow curve" for the rest of the flight.

First, he commenced a penetration/approach actual instrument conditions with a formation of mo than two aircraft in violation of General NATO (OPNAVINST 3710.7F). Furthermore, t penetration/approach was commenced with weath conditions at the field below circling minimums, also violation of General NATOPS, even in the case of two-plane formation. In view of the fact that one of t aircraft was NORDO, this lapse in good judgment cou have had disastrous consequences. It does not take mu imagination to recognize that the NORDO pilot capability to effect a safe approach/landing would ha been very limited if he had become separated from t flight.

Secondly, having made the decision penetrate/approach in formation, the flight should ha been organized at the outset to preclude the necessi for a lead change in solid IFR conditions. The fact th the intention to effect a lead change was abandoned w under the circumstances, one of the best decisions ma during the course of the flight.

In summary, this accident illustrates a hard fact: *pilot – particularly a pilot in command – can afford be complacent about even the most routine flight*. Su flights often have a way of becoming very exciti before they are over.

FLIP CHANGES

THE Department of Air Force, Headquarters Aeronautical Chart and Information Center, St. Louis, Missouri has notified the Naval Safety Center of the following changes to FLIP documents:

FLIP High Altitude Enroute Chart Information: Beginning with the 11 November 1971 edition of FLIP enroute charts:

- The elevation, length of longest runway, ATIS frequency and the symbol indicating the availability of PFSV will be removed from the chart. Aerodromes will be shown only with the appropriate airport symbol and name.
- Only those aerodromes with runways 5000 feet or longer and with an approved published instrument approach procedure will be shown.
- ARTCC remote controlled air-to-ground sites will be removed from the chart and ARTCC frequencies on the front panel will be deleted.
- The unusable route symbol will be reduced in size.

A Page from the ASO's Songbook

Safety Officer's Lament

(To be sung to the tune of TA RA RA BOOM DEE AY)

Chorus!
TA RA RA BOOM DEE AY.
Have you been crunched today?
Or did you get away?
We had three yesterday.

There is a crunched A-6,
That we just cannot fix.
The blue shirts had their licks.
We hope they got their kicks. *(Chorus)*

See how that Phantom's bent;
Its wings asunder rent?
'Twas quite an accident.
Much moolah will be spent. *(Chorus)*

The Jolly's hangar queen,
Smashed by a lift machine.
The VIDS board had been clean.
Now no chance can be seen. *(Chorus)*

An F-8 came aboard.
And by a mighty hoard
Of forklifts it was gored!
How much can we afford? *(Chorus)*

A *Corsair* spotted aft.
A Tilly driver laughed,
Then smashed it fore and aft.
Oh what a mangled craft! *(Chorus)*

The Whale is big and gray
And always in the way.
I heard the deck boss say,
"I'll get them all today." *(Chorus)*

A Fudd that's seen inflight
Is such an ugly sight.
But one that's crunched in tight
Becomes a scenic blight. *(Chorus)*

The Cod is left to flit.
No letters? We've a fit!
It's hardly ever hit.
Must not be worth a . . . bit!!!! *(Chorus)*

The Bard of Va. Beach

Short Snorts

Knowledge is more than equivalent to force.

Samuel Johnson

A Short Story

THE PILOT of a HUP, flying alone, was enroute to NAS North from NAS South. He decided to leave the dubious security of a North Carolina secondary road (better than nothing) and fly direct over a swamp. At a point when he could autorotate into nothing but trees, his engine quit – and he did autorotate into trees. After branches had stopped all forward motion, they flipped the HUP sideways and it did a free fall, pilot's side down, the last 20-25 feet. When the pilot unstrapped to climb out, he noticed a jagged tree stump only 3-inches behind his head. He then waded out through the area infested with water moccasins (unscathed), found an abandoned rowboat and used it to get across a wide 20-foot deep channel just as the boat sank, slogged through a half mile of shallow swamp and finally reached the safety of the road he had departed a couple of hours before – without his shoes, shaving kit or any clothes other than his flight suit.

Pilots and crewmen flying cross-country today are better equipped to handle survival situations than they were in the old days – *aren't they?*

Stay With It

THE PILOT of an A-4 completed his carqual and departed the ship for Homeplate. Although existing weather did not necessitate it, he requested and was cleared for a GCA to runway 36. Winds were reported from 320 degrees, 18 knots – with gusts to 25 knots. After touchdown the pilot used left aileron and forward stick and raised his flaps. At about 80 knots the left wing began to rise and the *Skyhawk* started to drift to the right side of the runway. The tire on the starboard main landing gear blew first, followed shortly by a blown tire on the other main gear. Off the edge of the runway the aircraft skidded for about 150 feet in the sod before stopping 2500 feet from the end and about 50 feet right of the runway.

There was only limited damage to the aircraft but the embarrassed pilot was reduced from his heretofore ace-of-the-base status. The skipper assigned primary cause of the incident to pilot technique. The pilot did not land on the upwind side of the runway and made no attempt to go around or take the arresting gear. The crosswind correction was fine as far as initial deceleration was concerned but, as the aircraft slowed, the correction was relaxed allowing the upwind wing to rise with a resultant arc downwind.

A pilot facing a situation nea the operating limits of his aircraf should plan his actions as carefull as if it were an emergency. Th pilot did not plan for the nea maximum gusty crosswind whic existed and apparently did no consider any contingencies. A- pilots are reminded of that critica point in the landing roll when rudder and aileron effectiveness ar lost and the transition is made t directional control by brakes alone.

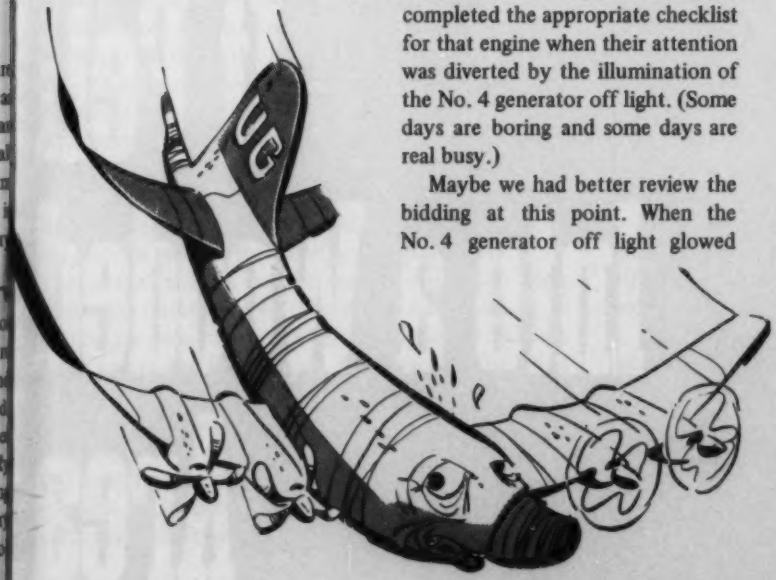
Hands Full

WHEN VP squadrons ar deployed they either go to area colder than a certain part of a Eskimo's anatomy or they go, a expenses paid, to some warm year-round resort area. The latter i classified as tough duty. This stor involves a crew on tough duty.

It was spring and, as one T meteorologist classified that time o year, it was when Mother Natur still hadn't made up her min whether to blow hot or cold During the standard weathe briefing the meteorologist carefull explained away the 100-foot ceilin and ½-mile visibility as temporar (might even improve before you go

due to a stationary front which was expected to become unstationary shortly. It isn't necessary here to go into the technicalities. Any pilot will understand. However, he stated the weather in the operating area was good and forecast the weather on their return to base as being no problem. Naturally, he did throw in the usual hooker – something like, the whole picture could change if the adiabatic dry lapse rate didn't lapse. After all, when a flight crew is headed out over the briny for a thousand miles or more, into an area where there aren't any reporting stations, a meteorologist has to cover his "six" someway!

So, the crew launched. Their takeoff was perfectly normal except that the end of the runway disappeared as soon as the pilot rotated. One hundred feet – Ha! They climbed to assigned altitude, solid on the gages, an hour later were pleasantly surprised to find themselves between layers. Shortly thereafter, as the undercast began to break, they sighted the ocean. In due time the pilot descended to operating altitude and secured No. 1 engine for loiter.



(When you have four, man, and are not in a hurry, you might as well conserve.)

Some time later the PPC left his seat to stretch his legs and strolled aft to see how the various members of the crew were getting along. He satisfied himself that they were all gainfully employed and that the equipment was in good working order. Well, sir, things were going so smoothly something had to happen. It did. Even though the PPC was without a headset and couldn't hear the chatter on ICS nor see the instrument panel, he sensed something untoward was happening. In 4 milliseconds and six giant strides, without even a "Mother, may I?" he was back in the cockpit in time to see the No. 2 engine chip light illuminate. Now, it is not unusual in the P-3 to have the props on one engine at attention, but when *two engines on the same side* are not burning, it is time to swing into action. The PPC took action.

He and the copilot looked at each other, agreed that the light was on No. 2 engine, carefully selected the correct E-handle and secured No. 2. They had no sooner completed the appropriate checklist for that engine when their attention was diverted by the illumination of the No. 4 generator off light. (Some days are boring and some days are real busy.)

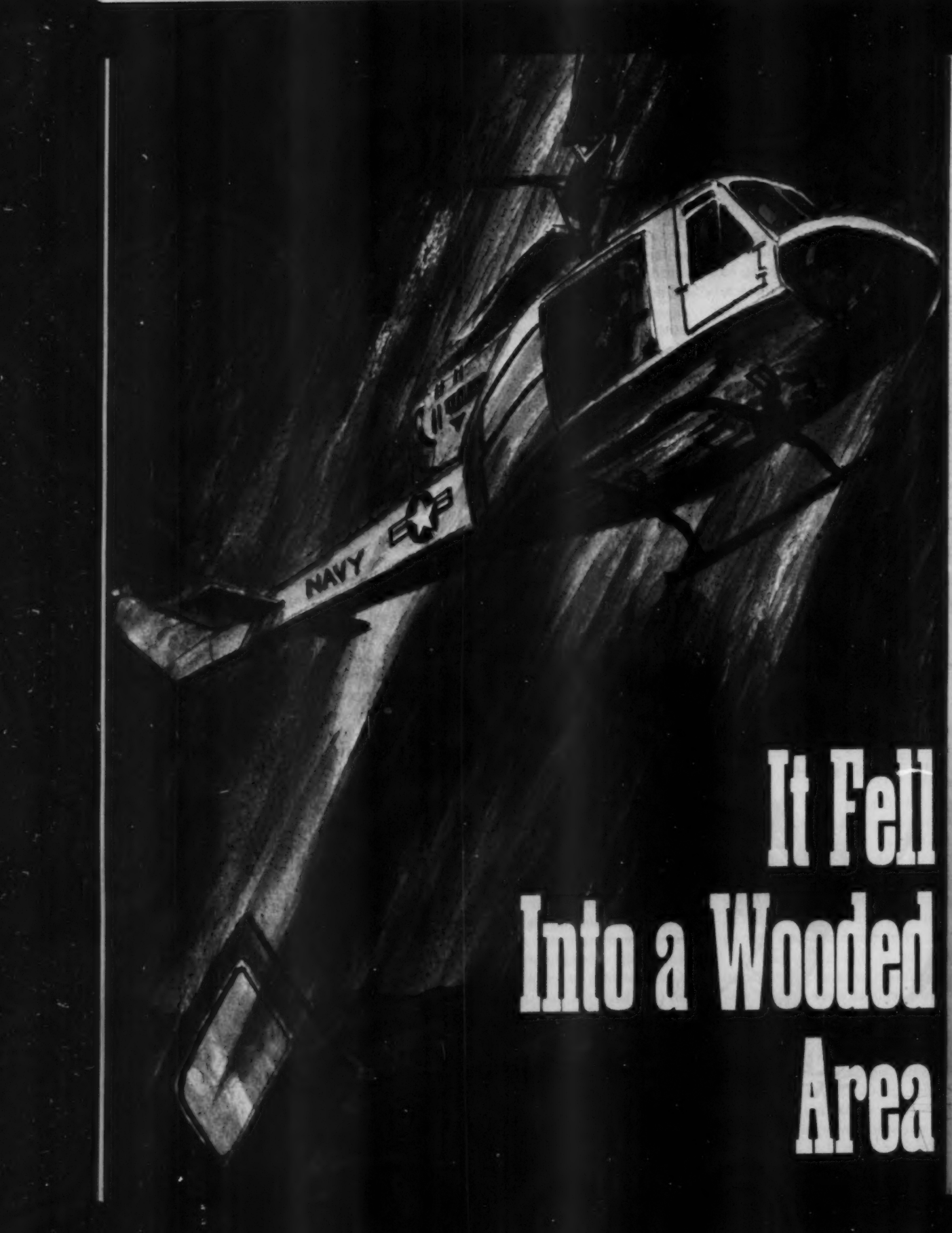
Maybe we had better review the bidding at this point. When the No. 4 generator off light glowed brightly, both No. 1 and No. 2 were off the line. In much less time than it takes to tell about it, the PPC and the copilot demonstrated pure cockpit coordination. Engine No. 1 was restarted, the aircraft was put into a climb (the heading for home had already been selected), generator reset procedures on No. 4 engine were attempted, the APU was brought on the line for extra juice and No. 4 engine was secured. Would you believe not one single item on any of many checklists was overlooked? Real pros!

So, now the aircraft is making knots for home at 6500 feet in VFR conditions with No. 1 and No. 3 turning and No. 2 and No. 4 not burning. The pilots would have preferred more altitude but the clouds prevented it and, remembering the icing in the clouds on their way out, the PPC did not wish to compound further an already compounded situation.

Just like the man said, the stationary front became unstationary and the crew was able to return to base in VFR conditions. An uneventful landing was subsequently made.

Postflight investigation revealed that the warning sensors weren't hollering wolf in jest. The No. 2 engine reduction gear magnetic chip detector plug contained a sliver of metal and the No. 4 engine generator supervisory panel had failed.

The actions taken by the PPC were by-the-book and brought joy to the hearts of his CO, his crew, their dependents . . . We would make book, however, that when he returned home, the PPC's bride gave him one of those "I've heard-'em-all-before" looks and blithely launched into her own stories of what happened to the children and herself while the PPC was away enjoying himself. C'est la vie! A hero at work, but at home . . .



It Fell Into a Wooded Area

By LCDR A. T. Hall, Jr., USNR (Ret)

RING . . . ring . . . ring. The telephone jangled in Base Ops.

"Base Ops, Jones speaking, sir."

"Sir, this is Mrs. Shackleford. I live 10-miles west and I want to report that a helicopter door just fell into my front yard."

"What was that, Ma'm? (A hurried search for a local map was made by the dispatcher while the conversation continued.) A door from a helicopter fell into your yard? Did it hit anything or anyone? Was anyone hurt?"

"No. The door just fell into the front yard." (The flurry of confusion continued while the lady's name, address, phone number and directions on how to reach her residence were obtained.)

"Thank you, Mrs. Shackleford. Someone will be out there to pick up the door. Thank you for calling."

(On the intercom) "Safety from Ops. Some whirlyhead just bombed a lady's yard with a door. Check it out and bring it back. Stop by here on the way out and I'll give you all the information I have."

Sometime later that day the story unfolded. It seems that a helicopter door had fallen off (just like the lady said) as it passed overhead, at an estimated 800 feet, while flying northwest, enroute to another air station. The door tumbled to the ground and landed in the front yard of a private residence – one of a cluster of six houses. It barely missed making contact with high tension lines of the electric company, hit the ground within 3 feet of a parked automobile and came to rest 10 feet from the initial impact point. The occupants of the house were asleep at the time. The door was identified as the cargo door of a helicopter and photographs were taken at the scene. One eyewitness was found and his story obtained. Also statements were obtained from Mrs. Shackleford and the owner of the car. The investigators returned to base with the door, the pictures taken at the scene and the statements.

A casual attitude on the part of most who knew about the incident didn't help the safety officer in putting the facts together. After all, no damage had been done; no one had been injured. Why sweat it? The job of trying to determine what helicopter was airborne with a missing door began. All local choppers were checked and found not to be flying. Ops personnel were questioned and had to be convinced that it must have been a transient. Sure enough, it was discovered that a transient helicopter had departed on a VFR flight plan about half an hour before Mrs. Shackleford's phone call. The parent organization was notified and so was Base Ops at the pilot's destination. The following day the pilot called the safety folks at the departure base to see if they needed any more information. He volunteered that a crewman in his helicopter did see the door leave the aircraft, watched it fall and reported that it fell into a wooded area. The pilot further stated that he had landed a few minutes later, in a farmer's field, inspected his chopper for damage and then continued (silently) on his way.

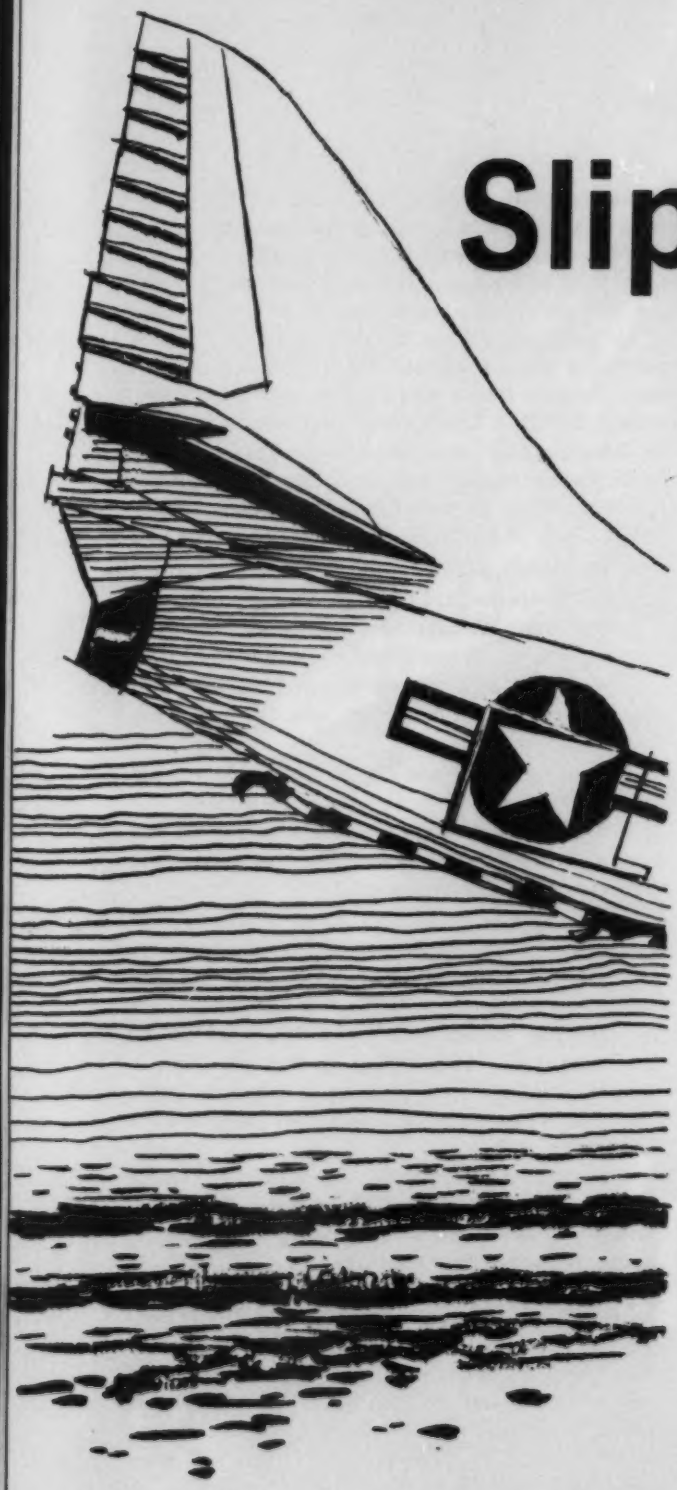
So, what do you say? End of incident? End of report. But *should* it be? There are a few unanswered questions. Like . . .

- Why wasn't an effort made by the pilot to contact his point of departure and report the incident?
- Why didn't the pilot check out the area where the door was *observed* to have fallen?
- When the pilot stopped to refuel and when he eventually reached his destination, why didn't he advise Ops?
- Would it have made any difference if there had been damage or injury?
- What caused the door of the helicopter to fall off?
- Will any purpose be served by the report which was eventually made, or by this article?

It is time to rebrief all flight personnel that procedures are established and should be followed to inform interested parties on details of inflight incidents and emergencies. Timely notification and investigation by informed persons will go a long way toward protecting flight crews, minimizing misinformation to the civilian populace and speeding up necessary reports. The possibilities of what might have happened are limitless.

Most persons will mumble, "Aw, forget it." Yet, one small voice cries out, "Why?" 'Tis the voice of the safety officer who cannot rest until all questions are answered and steps taken to prevent recurrence.

(From what we've seen here at NAVSAFECEN most pilots and crewmen religiously conform to OPNAVINST 3750.6G which establishes the requirements for reporting Navy aircraft accidents and incidents – of which this was certainly one. Yet, for the two percent who may not have the word, a quick look at Chapter I, pages 1 and 2 of OPNAVINST 3750.6G will dispel any doubts regarding what needs to be reported.) ◄



Slipping & Sliding

A SUBSTANTIAL number of aircraft accidents and incidents are caused by the failure of pilots to understand and/or cope with slippery runways. There are several reasons for slippery runways, but water seems to be the principal accident producer.

One example of how a wet runway can cause trouble involved an A-4F pilot. He departed for a cross-country flight of about 1 hour's duration. Destination weather was forecast to be 500-foot broken with 4-miles visibility in rain. Actual weather upon arrival was 400-foot overcast with 1-mile visibility in rain and fog.

During the GCA approach, the pilot was advised of a 12-18 knot crosswind from 220 degrees relative. He was further advised that braking action was poor and that there was, "an awful lot of water on the runway."

The pilot touched down 1000 feet down the 7500-foot runway at a gross weight of 14,750 (4000 lbs fuel), slightly fast. As the aircraft decelerated through 90-100 knots, the pilot commenced braking. At this time the aircraft swerved and sideslipped. Releasing the brakes the pilot corrected for the swerve, realigning the aircraft down the runway.

As he was approaching the arresting gear (located 1800 feet from the upwind end of the runway), the pilot caught sight of a 4000-foot-remaining runway marker on an intersecting runway and mistook it as being applicable to the landing runway. Believing he had another 4000 feet of runway, he decided to take off and make another approach.

As he added power, he saw the 1000-foot-remaining sign and realized he was about to go off the end. Quickly deciding he did not have enough runway to get airborne, he immediately secured the engine and began braking. It was too late. The aircraft left the runway at an estimated

speed of 60 knots, continuing into the soft overrun for about 500 feet before the nosewheel dug in and collapsed. Although the pilot was uninjured, the aircraft received substantial damage.

In retrospect, the pilot involved in this accident was not fully prepared for landing on a runway made short by adverse conditions. The 9 to 14-knot tailwind component, 8 to 12-knot crosswind component and wet runway dictated rigid approach/landing discipline. Unfamiliarity with the A-gear location was the clincher.

Hydroplaning

Research in recent years, primarily by NASA, has resulted in the identification and definition of three types of traction loss on wet surfaces which fall under the general term of hydroplaning. These are: dynamic hydroplaning, viscous hydroplaning, and rubber reversion skidding.

• *Dynamic hydroplaning.* When pneumatic tires of an aircraft (or highway vehicle) roll over water-covered or flooded pavements, hydrodynamic pressures develop between the tire "footprint" and the pavement. The higher the ground speed, the higher the hydrodynamic pressure. At a critical speed, hydrodynamic lift, resulting from the built-up pressure under the tire, will equal the weight riding on the tire. When this occurs, total dynamic hydroplaning speed has been reached. Any increase in groundspeed above this critical value lifts the tire completely off the pavement, leaving it supported by the fluid alone.

Research indicates total hydroplaning will take place only when surface water reaches a critical depth, *and* a critical speed has been reached. Critical water depth is approximately 2/10 inch but varies somewhat. Less water depth is required on smooth surfaces than on rough surfaces. In addition, bald or smooth tread tires tend to hydroplane in more shallow fluid depths than tires with ribbed or patterned treads. Therefore, smooth tires may hydroplane on very smooth pavement when only 1/10 inch of water is present. Conversely, a combination of ribbed treads and rough textured pavement may require a water depth of up to 3/10 inch for total dynamic hydroplaning.

Critical groundspeed for dynamic hydroplaning depends upon the tire inflation pressure. Assuming that the runway is flooded to a critical depth, it has been calculated that total hydroplaning will commence at a speed which is approximately nine times the square root of the tire inflation pressure. (This equation is valid for smooth tires or grooved tires where fluid depth exceeds tread groove depth.) For example, a tire inflation pressure of 100 psi would require a speed of 90 knots for the onset of total dynamic hydroplaning.

• *Viscous hydroplaning.* Viscous hydroplaning occurs at much lower groundspeed than dynamic hydroplaning. It requires only a thin film of fluid (perhaps as little as one-thousandth of an inch in depth) on a smooth runway. Fortunately, the texture existing on many runways is sufficient to break up and dissipate the thin viscous film which leads to this type of hydroplaning.

• *Rubber reversion skidding.* This can occur at speeds as low as 5 knots and requires only that the runway be damp. Here, if wheel rotation is stopped even momentarily, friction-generated heat and steam formed in the tire footprint. The steam is superheated a result of high pressures existing in the footprint are The temperature of the superheated steam causes th rubber to revert to its uncured state and form a se around the footprint area which traps the steam. As dynamic hydroplaning, this results in a near complet loss of braking effectiveness.

USN Use Of Runway Conditions Readings (RCR)

Runway condition (braking action) at USAF bases and certain USN airfields is determined by the use of decelerometers. Runway condition at USAF bases is reported by ATC facilities in terms of runway condition readings (RCR). By comparing the RCR to a table in the applicable aircraft flight manual, USAF pilots can determine predicted landing ground roll distances. However, similar tables are not available in the NATOPS manuals for naval aircraft. Accordingly, the following table of equivalents is furnished to provide a convenient method of converting RCRs to comparable braking action and predicted landing ground roll distances for use by naval aviators. Runway condition at USN airfields will be reported by air traffic controllers in terms of equivalent braking action as delineated in the following table:

Runway Condition Reading (RCR)	Equivalent Braking Action	% Increase in Landing Roll
00 to 05	Nil	100% or more
06 to 12	Poor	99% to 46%
13 to 18	Fair (Medium)	45% to 16%
19 to 25	Good	15% to 0

Runway surface conditions and RCR readings as reported by base operations are appended to hourly aviation weather observations in coded form based on the following:

Wet Runway	WR
Slush on Runway	SLR
Loose Snow on Runway	LSR
Packed Snow on Runway	PSR
Ice on Runway	IR
Patchy Conditions (Ice, Snow, etc.)	P
Runway Sanded	SANDED

EXAMPLES:

Packed snow on runway; decelerometer reading of 15.	PSR 15
Ice on runway; decelerometer reading of 8. Conditions patchy.	IR08P
Loose snow on runway; decelerometer reading of 20.	LSR20
Ice on runway; decelerometer reading of 5. Condition patchy, runway sanded.	IR05P SANDED

Extracted from IFR Enroute Supplement

Under conditions of total hydroplaning, aircraft tires suffer a near complete loss of braking traction and cornering capability. This loss can result in severe skidding under action of only small external side loads. Furthermore, even at lower speeds in deep fluids, partial hydroplaning can occur so that both tire-to-ground friction coefficient and cornering ability are reduced.

Be Prepared

Knowledge of existing runway conditions is a necessary element of preparing for landing. The IFR Enroute Supplement contains a section which discusses runway condition reports and the meaning they have for U.S. Navy pilots. This material is reprinted here (see accompanying box) in order to stimulate thought and discussion on the subject.

If difficulty is anticipated in stopping or maintaining directional control, there are several things a pilot might do to stack the odds in his favor. Specifically, he should be thoroughly conversant with the procedures spelled out in NATOPS flight manual for his aircraft, including stopping distances. In addition, he should give consideration to the following measures insofar as they do not conflict with NATOPS:

(1) Reduce landing weight as much as practicable to reduce approach speed to a minimum.

(2) Land on the longest available runway, considering crosswind and arresting gear limitations.

(3) If operating a carrier type aircraft, land near the end of the runway (on speed) utilizing a carrier type landing. Do not flare.

(4) Use all available drag devices (spoilers, speed brakes, etc.) if appropriate and not in conflict with NATOPS.

(5) Use rudder for directional control until below rudder effectiveness speed. If directional control is expected to be a major problem due to crosswind (or any other condition), consider an arrested landing utilizing approach-end or midfield arresting gear. In this way, arrestment can be effected before the rudder loses its effectiveness for directional control.

(6) Below rudder effectiveness speed use brakes (carefully) and/or nosewheel steering for directional control.

(7) Brake carefully. A conscious effort must be made to avoid locking brakes which could result in a loss of directional control (blown tire[s]), viscous hydroplaning or rubber reversion skidding.

(8) Be familiar with arresting gear location/capabilities. Be mentally prepared to drop the hook and plan to take the gear in severe conditions.

(9) Use reverse thrust devices if available and needed, providing you can do so without causing directional control problems.

(10) If arresting gear is not available and there is doubt that the aircraft can be stopped on the runway:

- If adequate runway remains, wave off; if not
- Secure the engine(s). Keep in mind that certain systems may be lost when the engine(s) is shut down.
- As a last resort, retract landing gear if prescribed by NATOPS for your aircraft.

Be prepared!

Hydroplaning

Research in recent years, primarily by NASA, has resulted in the identification and definition of three types of traction loss on wet surfaces which fall under the general term of hydroplaning. These are: dynamic hydroplaning, viscous hydroplaning, and rubber reversion skidding.

• *Dynamic hydroplaning.* When pneumatic tires of an aircraft (or highway vehicle) roll over water-covered or flooded pavements, hydrodynamic pressures develop between the tire "footprint" and the pavement. The higher the ground speed, the higher the hydrodynamic pressure. At a critical speed, hydrodynamic lift, resulting from the built-up pressure under the tire, will equal the weight riding on the tire. When this occurs, total dynamic hydroplaning speed has been reached. Any increase in groundspeed above this critical value lifts the tire completely off the pavement, leaving it supported by the fluid alone.

Research indicates total hydroplaning will take place only when surface water reaches a critical depth, *and* a critical speed has been reached. Critical water depth is approximately 2/10 inch but varies somewhat. Less water depth is required on smooth surfaces than on rough surfaces. In addition, bald or smooth tread tires tend to hydroplane in more shallow fluid depths than tires with ribbed or patterned treads. Therefore, smooth tires may hydroplane on very smooth pavement when only 1/10 inch of water is present. Conversely, a combination of ribbed treads and rough textured pavement may require a water depth of up to 3/10 inch for total dynamic hydroplaning.

Critical groundspeed for dynamic hydroplaning depends upon the tire inflation pressure. Assuming that the runway is flooded to a critical depth, it has been calculated that total hydroplaning will commence at a speed which is approximately nine times the square root of the tire inflation pressure. (This equation is valid for smooth tires or grooved tires where fluid depth exceeds tread groove depth.) For example, a tire inflation pressure of 100 psi would require a speed of 90 knots for the onset of total dynamic hydroplaning.

• *Viscous hydroplaning.* Viscous hydroplaning occurs at much lower groundspeed than dynamic hydroplaning. It requires only a thin film of fluid (perhaps as little as one-thousandth of an inch in depth) on a smooth runway. Fortunately, the texture existing on many runways is sufficient to break up and dissipate the thin viscous film which leads to this type of hydroplaning.

• *Rubber reversion skidding.* This can occur at speeds as low as 5 knots and requires only that the runway be damp. Here, if wheel rotation is stopped, even momentarily, friction-generated heat and steam is formed in the tire footprint. The steam is superheated as a result of high pressures existing in the footprint area. The temperature of the superheated steam causes the rubber to revert to its uncured state and form a seal around the footprint area which traps the steam. As in dynamic hydroplaning, this results in a near complete loss of braking effectiveness.

USN Use Of Runway Conditions Readings (RCR)

Runway condition (braking action) at USAF bases and certain USN airfields is determined by the use of decelerometers. Runway condition at USAF bases is reported by ATC facilities in terms of runway condition readings (RCR). By comparing the RCR to a table in the applicable aircraft flight manual, USAF pilots can determine predicted landing ground roll distances. However, similar tables are not available in the NATOPS Manuals for naval aircraft. Accordingly, the following table of equivalents is furnished to provide a convenient method of converting RCRs to comparable braking action and predicted landing ground roll distances for use by naval aviators. Runway condition at USN airfields will be reported by air traffic controllers in terms of equivalent braking action as delineated in the following table:

Runway Condition Reading (RCR)	Equivalent Braking Action	% Increase In Landing Roll
00 to 05	Nil	100% or more
06 to 12	Poor	99% to 46%
13 to 18	Fair (Medium)	45% to 16%
19 to 25	Good	15% to 0

Runway surface conditions and RCR readings as reported by base operations are appended to hourly aviation weather observations in coded form based on the following:

Wet Runway	WR
Slush on Runway	SLR
Loose Snow on Runway	LSR
Packed Snow on Runway	PSR
Ice on Runway	IR
Patchy Conditions (Ice, Snow, etc.)	P
Runway Sanded	SANDED
EXAMPLES:	
Packed snow on runway; decelerometer reading of 15.	PSR 15
Ice on runway; decelerometer reading of 8. Conditions patchy.	IR08P
Loose snow on runway; decelerometer reading of 20.	LSR20
Ice on runway; decelerometer reading of 5. Condition patchy, runway sanded.	IR05P SANDED

Extracted from IFR Enroute Supplement

Under conditions of total hydroplaning, aircraft tires suffer a near complete loss of braking traction and cornering capability. This loss can result in severe skidding under action of only small external side loads. Furthermore, even at lower speeds in deep fluids, partial hydroplaning can occur so that both tire-to-ground friction coefficient and cornering ability are reduced.

Be Prepared

Knowledge of existing runway conditions is a necessary element of preparing for landing. The IFR Enroute Supplement contains a section which discusses runway condition reports and the meaning they have for U.S. Navy pilots. This material is reprinted here (see accompanying box) in order to stimulate thought and discussion on the subject.

If difficulty is anticipated in stopping or maintaining directional control, there are several things a pilot might do to stack the odds in his favor. Specifically, he should be thoroughly conversant with the procedures spelled out in NATOPS flight manual for his aircraft, including stopping distances. In addition, he should give consideration to the following measures insofar as they do not conflict with NATOPS:

(1) Reduce landing weight as much as practicable to reduce approach speed to a minimum.

(2) Land on the longest available runway, considering crosswind and arresting gear limitations.

(3) If operating a carrier type aircraft, land near the end of the runway (on speed) utilizing a carrier type landing. Do not flare.

(4) Use all available drag devices (spoilers, speed brakes, etc.) if appropriate and not in conflict with NATOPS.

(5) Use rudder for directional control until below rudder effectiveness speed. If directional control is expected to be a major problem due to crosswind (or any other condition), consider an arrested landing utilizing approach-end or midfield arresting gear. In this way, arrestment can be effected before the rudder loses its effectiveness for directional control.

(6) Below rudder effectiveness speed use brakes (carefully) and/or nosewheel steering for directional control.

(7) Brake carefully. A conscious effort must be made to avoid locking brakes which could result in a loss of directional control (blown tire[s]), viscous hydroplaning or rubber reversion skidding.

(8) Be familiar with arresting gear location/capabilities. Be mentally prepared to drop the hook and plan to take the gear in severe conditions.

(9) Use reverse thrust devices if available and needed, providing you can do so without causing directional control problems.

(10) If arresting gear is not available and there is doubt that the aircraft can be stopped on the runway:

- If adequate runway remains, wave off; if not
- Secure the engine(s). Keep in mind that certain systems may be lost when the engine(s) is shut down.
- As a last resort, retract landing gear if prescribed by NATOPS for your aircraft.

Be prepared!

Strange Strikes

By LCDR D. A. Mohr, USN

THIS article is not about birdstrikes or aircraft stricken from the inventory because of strike damage. Rather, it's about contacts with objects by helicopter rotor blades.

The number of mishaps involving helicopter rotor blade strikes appears to be increasing from reports reviewed in CROSSFEED. This malady is not restricted to any particular helicopter model – it's applicable to all.

It makes little difference what the object is; at one time or another "everything" has been hit. Would you believe there is little probability that there are any "firsts" left? Helicopter rotor blades have made contact with wires, gun mounts, gun tubs, trees, antennae, bridges, rooftops, helicopter doors and hatches, the ground, telephone poles, fixed-wing aircraft, other helos, ground support equipment, and even the eaves of a house.

In case the above examples are not inclusive (they aren't meant to be), they have also pulled cargo pendants, hats, rags, canvas covers, tarps, rescue hoist hooks, sheet metal, and lifting straps into rotor systems.

Now you might think that pilots, whose lives depend on rotor blade integrity, would be very cautious when

such philosophy. It kind of makes you wonder what the CH-53 pilot would have done if he had found he had no control. The degree of damage rotor blades can sustain, and the shock to the rotor system, is hardly the kind that requires airborne inspections – look it over on good old terra firma. If there's a question about control, balance or rigging, get her down or stay down in the first place.

There have been two or three recent reports of helicopter blades chopping off whip antennae and contacting gun mounts. The pilot of one of the helos, even though vibrations were enough to scare him, flew 20 miles to Homeplate rather than land on the available pad of the ship he had hit. Another pilot *did* land and looked at the blades which were still rotating. *He didn't even shut down!* Wonder what he saw?

If blade contact is seen or felt, there is a reasonable doubt of the helo's airworthiness. Set it down, shut it down and let maintenance folks, the only ones authorized to release the aircraft, determine the severity of the contact. You might have to wait a while for the inspection, but there's something worth the wait – your hide maybe! ◄

maneuvering in unfamiliar areas. However, this is apparently not so! Perhaps combat experience has lulled too many into an overly aggressive attitude, or a misguided sense of confidence, that those blades are tough and can really take it. Up to a point that's true. But to maintain that comfortable up-lifted feeling, those blades and the entire rotor system must be carefully checked when *any contact* with foreign objects has been made.

Several incidents have been reported concerning pilots who have hit objects and continued flight without stopping to evaluate the damage. These incidents remind me of a sea story about an "old salt," a PPC, who sucked up his gear prematurely on takeoff allowing the prop tips to hit the concrete. When asked by his new copilot if he wanted to return and inspect the damage he replied, "Damage, huh! Let 'em fix their own runway."

Then there is the true story of a CH-53 HAC who, while climbing out of a valley, felt his blades strike several trees but continued climbing to altitude to check the helo's control response and flight characteristics.

While the philosophy of determining an aircraft's airworthiness after damage is recognized, climbing a *helicopter* to altitude after blade strikes is *not* a part of

The statistics for FY-71 helicopter incidents and accidents involving main and tail rotor strikes are shown below. Although the majority of damages were minor, there was one strike damage and six mishaps classified as substantial damage.

Helicopter Blade Strikes

FY-71

Model	July-Dec	Jan-June	Objects	Damage
H-1	8	4	Trees, power lines, antennae	2C
			Airframes, birds, ammo box	10E
H-2	0	2	Engine duct cover, tree	2E
H-3	1	5	Airframes, trees, table	1C
			Light pole, test stand	5E
H-34	2	4	Trees, airframes	
			Power line, dirt mound	6E
H-46	30	7	Trees, stumps, brush	
			Revetments, airframes	
			Birds, flagpole, phone pole	37E
H-53	3	7	Airframes, trees, wires	1A
			Revetments, debris	3C
				6E
H-57	1	1	Airframes	2E

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				6E
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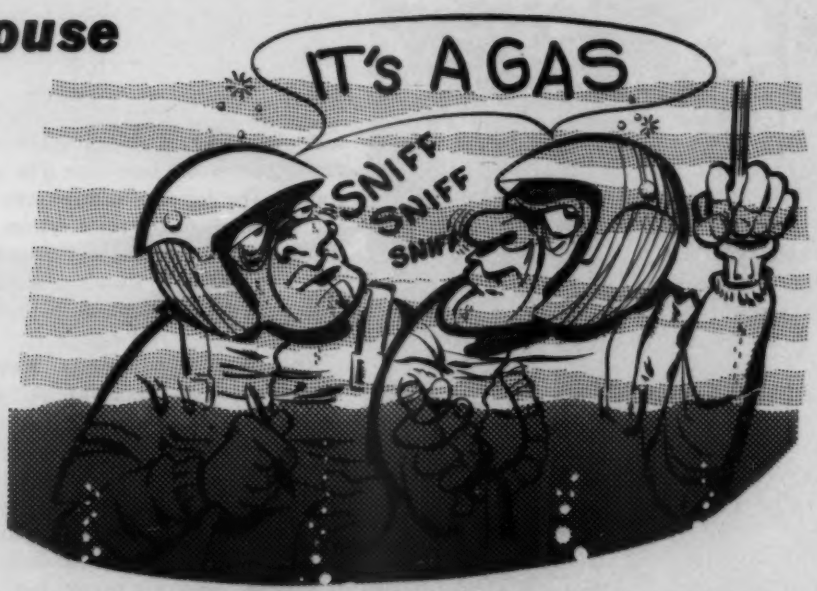
Anymouse



ON start of a return trip after a RO3N, I (the pilot) and my copilot noticed strong fuel fumes in our S-2B while taxiing to the runup area. We returned to the transient line at NAS Eastcoast and shut down for investigation of a possible fuel leak. Neither our crew nor line personnel could find anything wrong; but fuel fumes were still strongly evident. The transient line then called out a man, understood to be their troubleshooter for fuel leaks. After a rather cursory check of the aircraft, he offered the opinion that the leak was either expansion of fuel cells or excess from the gas heater in the nose (which had been used on the last flight). I accepted this poor explanation (get-home-itis) and continued the flight.

We still smelled fuel fumes while taxiing to the runway (wind was on the tail), but no fumes were evident after we took the duty runway (faced into the wind). We then took off. After level-off, there were no fumes aft, so the smoking lamp was lit.

After a fuel stop and passenger pickup at NAS Inland, light fuel fumes were noticed but passed off with the same excuse – "probably overflow due to expansion of fuel during hot summer weather." Again, we leveled off and after a passenger in back reported no fuel fumes, the smoking lamp was again lit.

To make a long story short, we flew a total of 11.9 hours that day and landed at NAS Westcoast at night.

During preflight the next morning, the aircraft was downed by the plane captain for fuel fumes in the aft section of the aircraft. During the subsequent inspection, a Quality Assurance representative walked aft of the aircraft, faced forward and shined a flashlight into the rear starboard wing beam area. He saw what appeared to be fresh paint (aircraft had come from PAR two weeks earlier). He put his hand into the area to check, and to his horror found that what appeared to be fresh paint was, in reality, a ½-inch puddle of fuel throughout the entire beam area.

Who would have been responsible if that flying bomb had disappeared off someone's radar scope as it burst into flames over a Midwestern state? Probably the pilot in command (me) for accepting the aircraft and, to a lesser degree, the troubleshooter who made the cursory check of the aircraft at NAS Eastcoast.

As the pilot in command, I feel fortunate to have a chance to preflight another aircraft. Next time I'm not satisfied with an explanation of a discrepancy, I'll write the gripe up and wait for a writeoff by maintenance control. At least that way it will be investigated more thoroughly.

Luckymouse

The purpose of Anymouse (anonymous) Reports is to help prevent or overcome dangerous situations. They are submitted by Naval and Marine Corps aviation personnel who have had hazardous or unsafe aviation experiences. These reports need not be signed. Self-mailing forms for writing Anymouse Reports are available in readyrooms and line shacks. All reports are considered for appropriate action.

REPORT AN INCIDENT, PREVENT AN ACCIDENT

We agree, you are fortunate to have the chance to learn from this incident.

Tell Somebody

THIS tale of woe has unknown roots in time and space since the perpetrator is unknown. The deed was uncovered during a 14-day inspection of one of the squadron's E-2Bs conducted toward the end of our first line period.

One of our non-rated parachute riggers was conducting his usual conscientious inspection of the E-2B's survival equipment when he uncovered the fact that the copilot's parachute ripcord safety tie was broken and the ripcord handle was installed backwards in its housing. Further investigation revealed that the ripcord cover flap was approximately 80 percent open. Additionally, the pilot chute was extending from its container although it was not completely out. Three of the ripcord pins were fully removed from their cones.

There is no conceivable reason why anyone would have deliberately committed such an unpardonable act. It is felt that someone snagged the ripcord handle and accidentally pulled it or somehow, unintentionally, caused it to be pulled. However, the fact that 1) it does take roughly a 27-pound pull to release the ripcord from its housing, 2) there is a rather definite sound when the pilot chute releases and 3) the ripcord had been improperly *replaced* in its holder, serve to point up a rather unpleasant reality: Someone purposely attempted to conceal an act which could well have cost a crewman his life.

Accidentally causing some article of flight gear to activate is no large problem *so long as someone in authority is told what has happened*. Concealing such an act, however, can quickly become a serious matter. This incident brings to mind the Safety Center poster with the B.C. cartoon: "If you don't know what it does, don't fool with it." I'll paraphrase that: "If you fool with it and break it – tell someone who can fix it!"

We couldn't agree with you more! In this instance, the parachute would have opened on bailout but the greatest danger would be premature opening **inside the aircraft***! Our congratulations to your knowledgeable striker, but where was your plane captain and his daily inspection per the Maintenance Requirement Cards? It's indeed unfortunate that certain individuals now and then feel themselves to be so "professional" as to risk taking those well-worn shortcuts to disaster.*

Wow! Lookee That.

IT was a routine night refueling operation aboard NAS Tropical Island. The JP-4 truck had been connected to a C-130 aircraft and everything was running smoothly. Suddenly, the security line watch, fuel truck driver and several nearby squadron personnel observed sparks inside the truck cab – the result of a wiring short circuit under the dashboard. The truck driver, a local civilian, immediately and without hesitation evacuated the area and disappeared – leaving the line watch and bystanders to handle the emergency. The line watch radioed the duty officer, who in turn, notified the fire department and crash crew. The bystanders did their best to fill the truck cab with CO_2 and disconnect the fuel hose. The crash crew arrived and after securing and disconnecting the truck, rolled it away from the vicinity of the C-130.

It is obvious what could have happened. Ignition of the fuel fumes could not only have claimed the fuel truck but also the aircraft and some lives as well. The driver should have been thoroughly familiar with emergencies that could arise during refueling and should have reacted on instinct to remedy the situation. It was a good deal of luck that this squadron did not lose one of its aircraft.

Sparkymouse

Supervision is the key to successful refueling operations. Think of it like this:

- S ome knowledgeable persons
- U sually must be present to
- P ersonally oversee that refueling procedures are
- E xecuted properly, safety precautions followed
- R eligiously and the operation carefully conducted
- V irtually error free.
- I t must be assumed that contract fueling
- S ometimes means that native truck drivers are not
- I ndoctrinated or trained in emergency procedures.
- O ccasionally, an incident such as this is another
- N otification that refueling is inherently dangerous. ◄


7
11

Don't Compound the SAR Effort

THE fraternity of aviators is close-knit. Consequently, when a plane goes down or is reported missing, search and rescue efforts are quickly mounted and continued as long as there is any reasonable chance of rendering aid to the downed or missing aviators.

Such was the case recently when a light civilian aircraft carrying three naval aviators and a civilian friend disappeared on a cross-country flight over mountainous terrain. An intensive SAR effort during the following 8 days failed to locate any trace of the aircraft or survivors. At this stage, little hope remained. Nevertheless, naval aviators attached to units at the homebase of the missing aviators continued the search on a volunteer basis, in coordination with the responsible SAR unit.

Among these volunteers was a young pilot with approximately 1000 hours total flight time – most of which was single-engine jet time. Prop time was minimal: T-34 time in the training command and 19 hours in the T-28, all of the latter being acquired during the previous 4 months. This pilot had, in fact, completed his T-28 NATOPS check on the day before his SAR effort.

The copilot for the SAR flight had a few hundred more hours total time, but it too, was almost pure jet time. He had a total of 13 hours in the rear seat of the T-28, but none of it could be considered as practical pilot training time.

They launched shortly after noon with the pilot who had just completed the T-28 NATOPS check in the front seat as pilot in command. The other pilot occupied the rear seat as copilot/observer.

After approximately 2 hours flight time, during which the search was conducted at about 200 feet AGL and 130 to 180 knots, the pilot commenced a climb up a steep concave valley that culminated in a 9000-foot ridge. The climb was started at 150 knots, and as the airspeed dropped to 130 knots, power was added. To maintain terrain clearance the nose was progressively raised, and the airspeed rapidly bled off. The pilot was unable to turn or reverse course because of high ridges on either side of his flight path. At 80 knots the left wing contacted an 85-foot pine tree, ripping off the outboard end of the wing and slewing the aircraft violently to the left. The right wingtip then impacted the ground breaking the wing off at the root. As the aircraft came to rest on its side, it was engulfed in flames. The copilot in the rear seat, although seriously injured, crawled clear of the aircraft. The pilot was fatally injured. The copilot was subsequently rescued by helicopter.

An engine DIR and the statement of the surviving rear seat observer indicated the engine was operating normally at the time of the crash.

During the investigation an attempt was made to reproduce the flight conditions preceding the crash. It was found that it was possible to maintain a 20-degree angle-of-climb (the approximate slope of the ridge) at 2000 to 3000 fpm with full power on the aircraft. However, aircraft attitude required to maintain a 20-degree angle-of-climb was 30 to 35 degrees nose-up. Naturally, this severely restricted forward visibility.

Investigators concluded the most probable cause of the accident was the pilot's attempt to climb over the ridge at too slow an airspeed. The resulting nose attitude precluded his seeing the tree in his path.

The investigators also noted that there was an element of supervisory error involved. That is, although the pilot was qualified in all respects according to OPNAVINST 3710.7F and the T-28 NATOPS Manual, he did not have the experience required to fly a SAR mission in mountainous terrain. He simply did not have the training or experience to know the performance limitations of a propeller driven aircraft.

This accident emphasizes the fact that lack of reciprocating engine experience among recent flight training graduates has left many young aviators unaware of danger areas in the flight envelope unique to propeller driven aircraft. In the past, these danger areas were considered common knowledge; however, with the increasing number of naval aviators being graduated with minimal propeller aircraft experience, commands must give close attention to *actual* pilot experience during prop aircraft checkouts.

Finally, when fellow aviators come to grief, it is both natural and commendable to do everything possible to aid the SAR effort. However, all concerned – *individual pilots and supervisory personnel* – must temper their actions with a realistic appraisal of capabilities.

Don't compound the SAR effort. ◄

On the need for OBJECTIVITY

CORRECT decisions require a high degree of objectivity. This is particularly true when it comes to flight operations, since seemingly minor matters often have a way of becoming important concerns before a flight is over.

A study of accident reports indicates many aircraft accidents might have been avoided if the individuals involved had been more objective. Get-home-itis and can-do-itis are two factors often implicated in a pilot's failure to be objective, but there are others. The fear of being cast as less than gung-ho may make a pilot accept an aircraft which is not ready in all respects for flight, or cause him to fly when overly tired.

Although many other factors could be discussed as tending to destroy objectivity in the decision making process, few if any are able to stand up as good reasons during the penetrating analysis following an accident.

Here are a few examples of how a lack of objectivity figured in accidents or incidents:

No Instrument Lights

A pilot and RIO preflighted their F-4B aboard a CV in preparation for a two-plane BARCAP mission. Launc was scheduled for daylight, but it was expected that th flight would extend into darkness and terminate with night landing.

Preflight was normal, but during poststart checks th pilot found his normal instrument lights to b inoperative. It was later determined that the lack o instrument lights was due to a blown fuse. However, th pilot did not know this and, not wanting to lose th flight, checked his other lighting. He found the RIO ha good cockpit lighting, including instrument lights plus good personal flashlight. He also determined that h own console instrument lights and console floods wer operative, so he decided to launch.

After a normal day catapult launch, the F-4 (Bluebird 101) joined his playmate, and they proceede on the mission. Shortly after arriving on statio

Bluebird 101 assumed the lead so that the pilot might gradually adjust to flying without normal instrument lighting. The rest of the mission was uneventful, and the two aircraft separated for vectors back to the ship and individual recoveries.

Bluebird 101 was vectored overhead the ship at 3000 feet and then cleared downwind at 1200 feet. The pilot, in consideration of his substandard lighting, requested a delayed turn to final in order to allow time to adjust his utility floodlights to illuminate the gear and flap indicators. He was also using the RIO's personal flashlight for cockpit illumination.

The first part of the approach was smooth, with the aircraft going a little high at three-fourths of a mile. To correct for a slightly high start, the pilot reduced power but failed to reset it as the aircraft settled onto the optimum glideslope. Starting to go low, he added too much power causing the aircraft to climb and accelerate in close. Over the ramp, the pilot dropped the nose increasing his airspeed and rate of descent. He caught the No. 3 wire but touched down very hard, blowing the starboard tire and causing substantial damage to the landing gear.

This accident was caused, obviously, by poor technique during the approach and landing; however, the pilot's decision to take the aircraft without full instrument lighting is certainly suspect as a predisposing factor in this accident. The use of floodlights (and the RIO's flashlight) caused an abnormal amount of glare around the canopy and within the cockpit. This complicated an already difficult transition from instruments to the meatball.

During an interview shortly after the accident, the pilot related his apprehension during the approach at the thought of boltering without normal instrument lighting. This uneasiness may have caused his attempt to salvage the high-and-fast situation at the ramp instead of executing a waveoff or accepting a bolter.

It would be stretching the truth to say this accident was caused directly by the pilot's error of accepting the aircraft without fully operative instrument lighting (in violation of standing orders). Yet, there is little doubt that by so doing, he increased the odds against a safe completion of the flight.

Get-Home-Itis

Two young jet-trained pilots took a T-28 and departed for an Air Force Base several hundred miles away, intending to RON. Both pilots were assigned proficiency flying billets, and the propeller aircraft experience of both was very limited.

After landing at their destination, the copilot immediately departed by car for his hometown located about 100 miles away.

The next morning the pilot, who had spent the night at the BOQ, checked in with weather and learned of the possible development of a WW (severe weather warning area). He then called his homebase and obtained permission to RON an additional night.

The WW failed to develop as predicted, however, there was a band of severe weather approaching the base. The pilot, anxious to get home, decided his best course

of action was to depart the base *before* the predicted weather arrived. There was only one hitch – his copilot was more than a 100 miles away, and it looked like the weather would arrive before the copilot could return. Therefore, to save time, he telephoned his copilot and said he would pick him up at a small civilian airport located closer to the copilot's home. He then departed the Air Force Base alone.

Continued

Upon landing at the civilian field, the pilot misjudged his speed as he came to the end of the 4200-foot runway. He failed to negotiate a turn onto the taxiway and eased off the hard surface into a bed of gravel along the shoulder of the taxiway.

He surveyed the situation and decided to apply power and taxi back onto the hard surface. However, as he applied power, the nose strut compressed and the nosewheel dug deeper into the gravel. The combination of the prop tip vortices and the nearness of the tips to the gravel was sufficient to cause gravel-peening of the leading edges of the prop. The pilot then shut the engine down and inspected the blades.

Lacking expert assistance in assessing the damage, the pilot made a decision on his own. He decided in his own mind that the damage was minimal, and he would continue the flight. Obtaining the assistance of five civilian spectators, he had the aircraft pushed back onto the taxiway. He then picked up his copilot and continued the flight.

Unfortunately, his efforts to return to homebase without delay were for naught. Extremely poor weather at homefield forced a divert to another Air Force Base, and it was not until the following day that they finally landed at homefield.

The commanding officer, in reporting this incident stated in part:

"Providence was certainly smiling on these two young aviators through the two takeoffs and several hours in the air that transpired after the prop sustained damage. Although the pilot did not experience vibration, probably due to the equal wear on each blade, there is sufficient reason to believe that the structural integrity of the blades was adversely affected by the gravel-peening. Wear on the prop tips is estimated to have approached ¼ inch of metal. To top off the flight, the pilot reported the prop damage on the yellow sheet but left the aircraft in an UP status!!"

The CO went on to say: "The urge to get home sometimes clouds clear thinking and makes for irrational decisions. This kind of situation has occurred since the advent of the airplane and will, unfortunately, continue in the future. The only solution possible to this problem is a continuing educational program designed to inculcate into all pilots' minds that the need to get somewhere, except in a few isolated operational situations, is never so pressing that chances should be needlessly taken."

Didn't Want to Short-Change His Student

A student pilot and a flight instructor departed homefield in a T-2B for a transition stage syllabus flight. After 45 minutes of high work, they descended into the landing pattern at an outlying field for touch-and-go landing practice.

The student executed a normal break and set himself up, as instructed, for a normal full-flap landing. To make a long story short, the student flew a poor approach and the instructor failed to properly correct his errors. The result was a very hard landing. So hard, in fact, that the instructor immediately took control of the aircraft, took off, left the gear down, and headed for homefield. It was his intention to get an inspection of the landing gear and then make a final landing. Enroute to homefield, however, the instructor began to lose his objectivity.

He visually checked the main landing gear (nose gear was not visible) but could not detect any damage. He then began to think about his student. Since most of the syllabus manevuers had been completed prior to the hard landing, the instructor expected he would be required to mark the flight complete even though the student had not had the opportunity to practice all his landings.

The instructor felt responsible for the hard landing and felt it would be detrimental to the student's training progress if, because of poor aircraft availability, the overload of students, bad weather, or whatever, the student sat on the ground for a week or 10 days thinking about the hard landing. He was, therefore, strongly motivated to provide the student additional landing practice if at all possible.

In addition, the instructor entertained strong, if unfounded, hopes that the aircraft was undamaged. He was also concerned over possible censure if he incompleted the hop and it turned out that the aircraft *was* undamaged. With all these considerations in mind, by the time he reached homefield, the instructor had decided to get a visual check of the gear from the RDO and, if it appeared to be undamaged, to complete a series of touch-and-go's.

Arriving in the break, he found the radio frequency to be saturated with transmissions. At this time he put aside all concern for the condition of the landing gear and allowed his student to shoot seven touch-and-go landings before taxiing back to the line.

Once back in the chocks, a lineman noticed cracks in the upper portion of the starboard main landing gear. Further inspection revealed a bent nose strut piston, a cracked MLG strut and pinion pin assembly, and wing panel rivets loose on top of the starboard wing.

The instructor's concern about not short-changing his student in training opportunity was commendable but, as the instructor later stated, it did nothing one way or the other to alter the physical condition of the landing gear. In retrospect, it is fortunate indeed that this lack of objectivity did not result in greater damage to the aircraft or injury to its occupants.

Strive for Objectivity

Good supervision and standardization both tend to promote objectivity in making decisions, as does the crewmember concept. However, it is the nature of the business that more often than not, the individual is on his own. In many cases, he and he alone must provide whatever objectivity goes into the decision-making process.

It is often difficult to be cool and analytical, especially if one is in a hurry to get somewhere, has a strong urge to get the job done, or fears to appear less than capable at all times. It is at these times that the individual must put his intentions to the test. He should ask himself: *Does the action I am contemplating have a potential to put me behind the eight ball? Will it make me less capable if an emergency arises?* If the answer to either of these questions is affirmative, this is the signal that the matter deserves more thought.

When a recognized problem arises, but you feel the urge to press on regardless, that's the time to stop and think it over – objectively. There is simply no point in stacking the odds against yourself when you've clearly another choice.

THE BALLA

(or Back in t

I.

"Hit's a cinch!" said Big Jim,
As he nitpicked his friend,
His faithful old hoss named Old Faithful.
"Ah'm as fit as befo'
"Ah got offen the flo'
"At Miss Lizzie's collation so playful."

("Cept a broke tooth or two
"Ana eye black an' blue
"Ana coupla bitty oak splinters.)
"Whad'yuh mean, ah cain't rhide?"

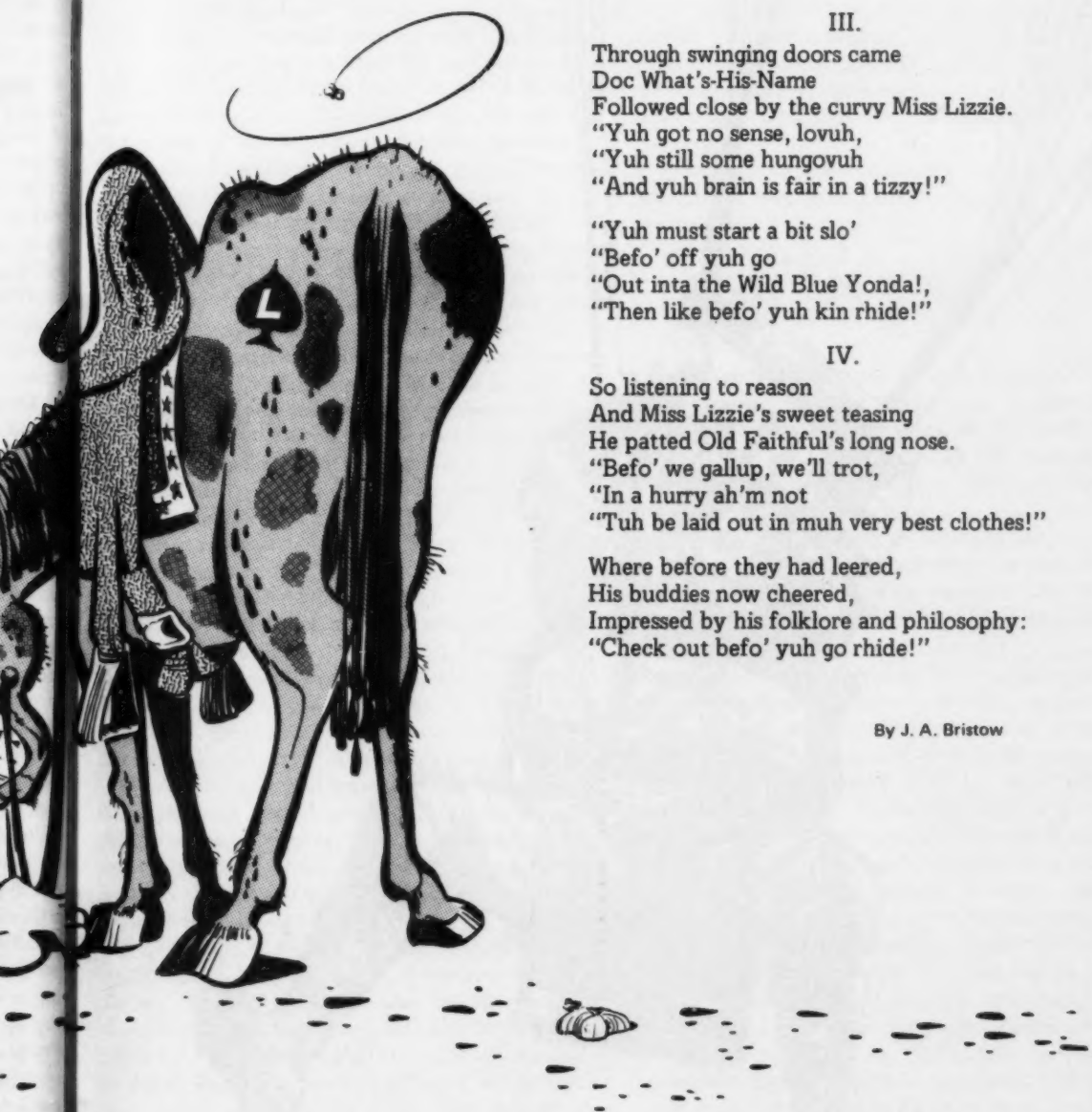
II.

So he climbed up on high,
Took a squint at the sky
And fell off in a heap on the ground.
Gave his levis a whack,
Brushed the dust off in back,
And defiantly looked all around.

His audience few
Was doubled in two
With shrieks of loud raucous laughter.
"Thas whut we mean – yuh cain't rhide!"

A OF BIG JIM

in taddle Again)



III.

Through swinging doors came
Doc What's-His-Name
Followed close by the curvy Miss Lizzie.
"Yuh got no sense, lovuh,
"Yuh still some hungovuh
"And yuh brain is fair in a tizzy!"

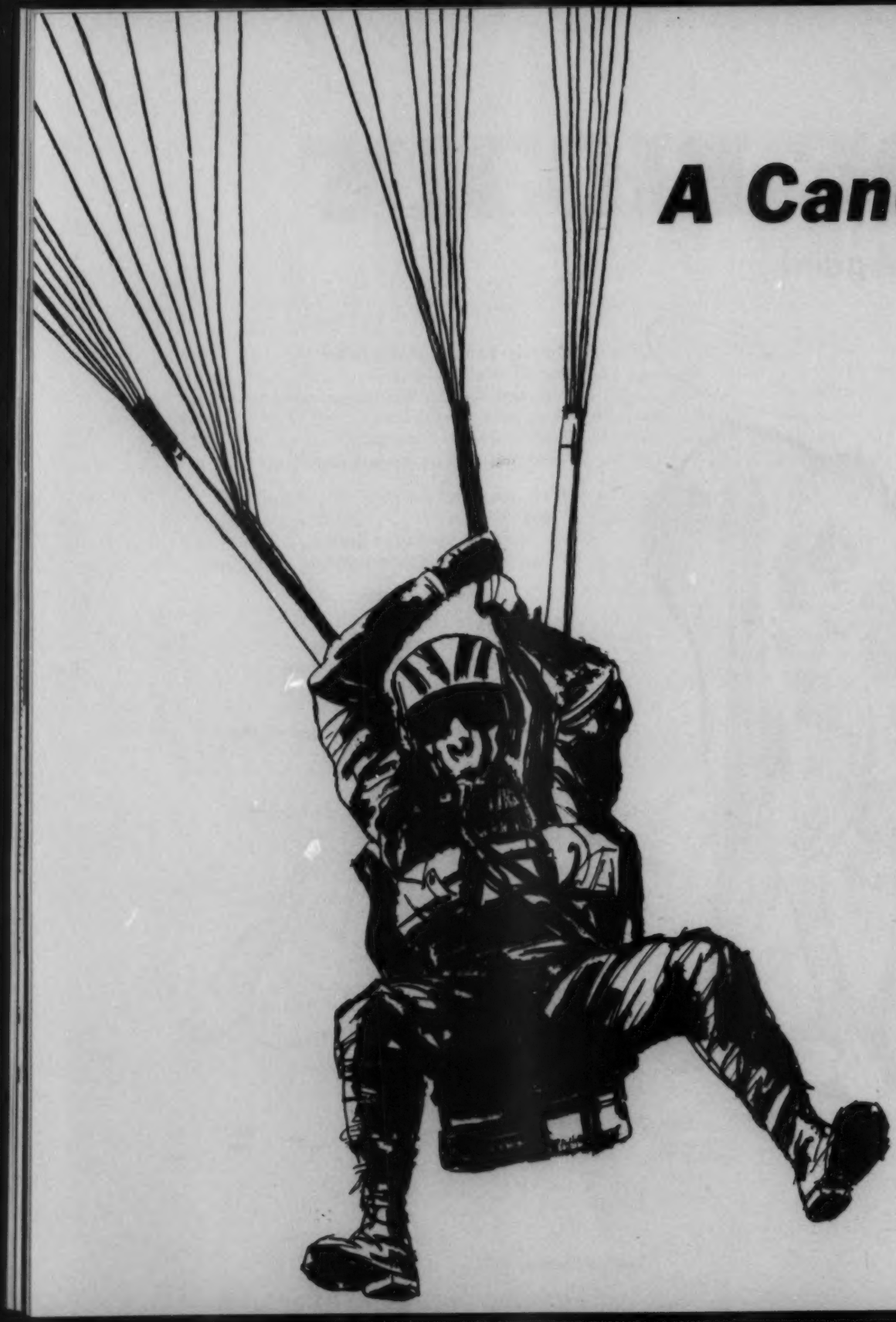
"Yuh must start a bit slo'
"Befo' off yuh go
"Out inta the Wild Blue Yonda!,
"Then like befo' yuh kin rhide!"

IV.

So listening to reason
And Miss Lizzie's sweet teasing
He patted Old Faithful's long nose.
"Befo' we gallup, we'll trot,
"In a hurry ah'm not
"Tuh be laid out in muh very best clothes!"

Where before they had leered,
His buddies now cheered,
Impressed by his folklore and philosophy:
"Check out befo' yuh go rhide!"

By J. A. Bristow


A Candl

By MAJ Samuel A. Munch, Jr., USAF

dland a Plan...

A GENTLE tug at your "all-over" ends a crazy period of suddenly hot, suddenly cold; things go red, things go black. Your eyes begin to focus but your mind doesn't believe what you see. You're really out here in darkened space, sitting in a parachute and rapidly descending to the middle of nowhere. You don't even recall leaving that wonderful warm cockpit. Because you've been over it a thousand times, your subconscious completes the bailout functions. Look up and check the chute – all okay . . . Here comes terra firma. A quick look around shows lots of snow, a large forest and no lights. Wham – slip – wham some more and you sit gently in a cool snowbank. Nothing broken but things could be better. Sure wish you had that heavy, hooded winter jacket that was so neatly stowed away before flight. It's really cold, and you want to move – anywhere and fast. The urge to move is very strong, but there is nowhere to go. It's cold and there is no way to warm.

Could this be you? Twelve hours from now would you be a survivor or a fatality? These odds are pretty poor, but no worse than some of our actual winter bailout experience. It is difficult to identify that special ingredient that differentiates between the survivor and the fatality. Possession of good physical condition, determination and a positive mental attitude is a great start. The rest lies between a little luck and a healthy respect for the survival conditions of the particular operational climate. It is likely that some advance mental preparation has been the saving grace.

True, a short period of winter survival with a standard kit should only create a good war story for you. The same, improperly prepared, in a cold isolated area might well be fatal. A review of bailout experience indicates two essentials that ease the way: a minimum survival kit and a personal survival plan.

A portion of the highly successful SEA survival/evasion story can be attributed to crew planning. The basic goals of the two situations are identical and the environments are equally hazardous. The first 12 hours are the most critical. If you overcome the initial shock and the strong "panic action urge," your chances of seeing the whole thing through are increased manyfold. During the period 1965 through 1969, there were 571 (Air Force) over-land bailouts. The USAF SAR team picked up 263 lucky ones in their first hour on the ground. Only nine persons waited in excess of 6 hours and four persons went over 16 hours. This is a comforting record. But, you could very well be the next exception!

Therefore, why not examine at your leisure a few thoughts to help assure your attendance at the next unit happy hour.

Once on the ground:

- Remain in the immediate area.
- Cover exposed skin surfaces and keep dry.
- Find shelter.

These requirements should be easily attained if you do everything just right and you have that hard survival kit you have endured all these years. But things seldom go just right. So practice for the worst and enjoy the best. Consider survival with the absolute minimum equipment.

First of all, you have the chute beeper, the chute minimum survival kit and whatever you carry personally. We'll leave the personal provisions for you, but bouillon cubes and a candle would definitely be useful. Now, to survive 12 hours:

- Remain in the immediate area – good advice. The first urge to move, move anywhere, is often the beginning of the last mistake. If you were anywhere near course, you will be in the area of the initial concentrated search and your beeper will be most effective. Remember to protect it from the cold. If you must move, be sure to plan carefully to insure a safe, dry passage to a clear goal that offers protection or increases your chances of being spotted. *Conserve heat and energy.* Don't make matters worse by stumbling into a hidden stream. Wetness is now your biggest enemy.
- Cover the exposed skin. A person dressed only in thermal underwear, flight boots, a flying suit, and a summer jacket would be quite uncomfortable, but he could last a long time. Very few people who inadvertently spend a night in the woods, even though improperly clothed, actually die of exposure. So use that knife and a part of the chute to make additional clothing

to cover exposed areas and be comfortable. Keep snow out of your boots, gloves, and clothing. Cut yourself a bushy limb for a snow brush and use it. Once you are clothed and somewhat protected, your primary danger becomes moisture. You must remain dry. You must plan (better to have preplanned) each action carefully. Do not overexert and start sweating. Open your garments or remove heavy outer clothing when moving and working, but rest and recover yourself at the very first sign of chilling. If you do perspire and soak your clothing, the subsequent fabric freezing will destroy the insulation properties. You must take shelter, remove the frozen articles and beat the ice out with a stick.

Frostbite, the next enemy, is considerably easier to prevent than to cure. Be particularly aware of any abnormal extremity cooling. Try to keep your hands warm (by limited exercise if necessary) and use your hands to check the rest of your body. Normally, the first sensation is numbness, followed shortly by a grayish/yellowish discoloration of the skin. Once frostbite is established, the remedy is *rapid warming*, not rubbing or exercise. Without outside heat, the best you can do is warm the affected part with your own body heat. Your warm hand to your cool face, ears, wrists, etc. Your cool hand to your warm body. The ounce of prevention applies doubly to your feet, as they are the most susceptible and the hardest to cure. Absolutely keep your feet dry. Keep the blood circulating by moderately exercising the ankles and wiggling the toes. Do not wear tight shoes and try to keep your feet off the ground when resting. Remove your boots regularly to check your feet and warm them with your hands, while drying your socks inside your clothes. The big secret has to be prevention, not cure – by careful planning.

• Shelter will be a primary requirement. With a temperature of 5^0F and a breeze of 8 miles per hour, travel and life in a temporary shelter is only disagreeable. If the temperature drops to -30^0F and the wind doubles, the face may freeze in 30 seconds, and prolonged exposure becomes very dangerous. (Check the pocket size wind chill chart included with this article. It may inspire you to new and better survival plans.) AFM 64-3 has many suggested shelters with detailed instructions. (The Navy equivalent is the Survival Manual, NAVWEPS 00-80T-56.) Depending on the natural resources available, time, and visibility, you might make yourself quite comfortable. If snow conditions are right, a tree-pit shelter would be the most expedient. A quick simple shelter, tested at K.I. Sawyer AFB last winter (temperature $+10^0$F, wind 15 knots, chill factor -18^0), involved merely draping the chute around a medium-sized, bushy evergreen as many times as possible. Snow was tramped along the ground edges to hold it in place and it was ready for occupancy.

The lower limbs (relatively free of snow) were cut and used as a brush to remove the inside ground snow and later to provide ground insulation. Some of the twigs under the tree were even dry enough to be used for kindling. Total time was 14 minutes.

For experimental purposes, we provided a small candle. (Candle and bouillon cube are in the Navy SEEK-2 kit.) There is no doubt that a little light at night would be particularly welcome and would provide a heat source for spot warming extremities and drying socks. The candle alone does not have much positive effect on

the temperature in a large area, but in close quarters, in conjunction with body heat liberated by loosening clothes, the temperature within this shelter reached +32°F in 6 minutes. Wind effect was completely nullified. The survivor was basically comfortable and could have continued to be so for a considerable period.

Most of us can easily skip a few meals, but bailout history indicates most people develop quite a thirst during the experience. You can readily make a pan from the tinfoil contained in the minimum survival kit in your chute and obtain water from local streams or by melting snow/ice. Given a choice, melting ice is much more rewarding than snow.

Do not neglect purification precautions. That candle (the one you're going to put in your flying suit pocket) will be quite useful – and hopefully the water project will employ you gainfully until rescued. It is entirely possible you might have to wait for ground rescue in remote areas, but an air drop of all the additional survival goodies should make the wait a breeze.

As for our original hero – he still sits in that cool snowbank. The initial shock is wearing off and his mind is keenly recalling everything he has ever heard about winter survival. All the facts have been digested and his computer-like mind is calculating a fantastic plan. When – wouldn't you know it – here comes some happy soul on a snowmobile. He has a smile as big as a barn and happily hurries him off to the local tavern as the guest of honor. *The great adventure ended before it began – but aren't you glad he had a candle and a plan?*

Courtesy COMBAT CREW

Cooling Power of Wind on Exposed Flesh Expressed as an Equivalent Temperature (under calm conditions)

Estimated wind speed (in mph)	Actual Thermometer reading (°F.)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
	EQUIVALENT TEMPERATURE (°F.)											
calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-24	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-32	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-95	-110	-124
25	30	16	0	-15	-29	-44	-58	-74	-88	-100	-110	-133
30	28	13	-2	-18	-33	-48	-63	-78	-93	-109	-125	-140
35	27	11	-4	-20	-35	-51	-67	-82	-98	-113	-129	-145
40	25	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
Wind speeds greater than 40 mph have little added effect.	LITTLE DANGER (for properly clothed person) Maximum danger of false sense of security.				INCREASING DANGER Danger from freezing of exposed flesh.			GREAT DANGER				

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Source: NAVMED Bulletin 5052-29

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By opening up one engine to full power, the Anson progressed through a sideways slide until it was travelling backwards. At this stage full power on both engines was accompanied by a rapid deceleration, and the aircraft was successfully brought to a halt. Was this the birth of reverse thrust? Unfortunately there were no witnesses to the feat, and on recounting his tale of resourcefulness and lightning quick reactions, no one believed the pilot.

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Ministry of Defence
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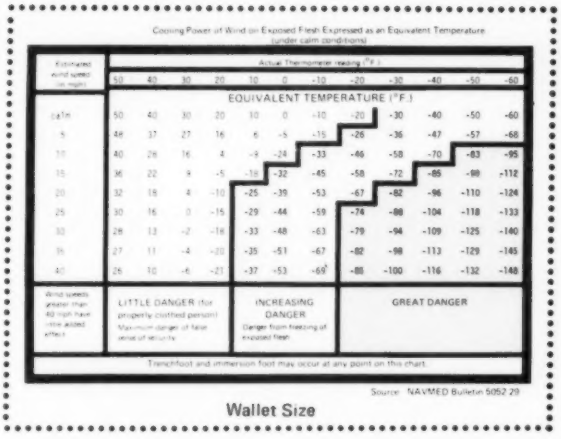
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20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-124
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
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Editor, Air Clues
Ministry of Defence
London

Almost Wet

By MEDmouse

THE setting for this story is a CVA in the Med during early winter. The weather is typical for the time and place (overcast, rainy, and cold). The ship is operating under *emission control* – no voice transmissions on radio and only the friendly smallboy tacan for a navaid. The aircraft involved is an RA-5C whose mission is to proceed outbound to locate probable surface contacts at anchor, 400 nautical miles away, and return. A no-sweat mission? Well, let's look in on the flight from time-to-time and see what happens.

The cat shot was a beauty. Gear and flaps up, checklist completed, a climb to FL 250, and the RA-5C proceeds uneventfully on course.

Launch plus 40:

RAN: "Hey Babes, my system is pretty poor now but still usable . . . and my radar is spoking something terrible."

Pilot Extraordinary: "No prob. Keep me advised."

Launch plus 1+00:

RAN: "I've lost my nav system altogether. It's overtemped. But I have the target on radar as a possible."

P.E.: "Rog. Descending."

RAN: "Target's ahead 15."

P.E.: "Rog. Got 'em in sight. Camera's on. One run."

RAN: "Rog."

P.E.: "Okay, that does it; which way home?"

RAN: "Turn to 279 degrees and climb to FL 350."

P.E.: "Rog."

Launch plus 1+30:

RAN: "You won't believe this, but I've lost my radar . . . no TACAN lock-on."

P.E.: "That's okay, I've got a good D.R. We'll crotscheck and let down on time. The ship should be within 5 miles or so."

RAN: "No sweat."

Launch plus 1+45:

P.E.: "Letting down now. Should be perfect. Just in time for recovery. Fuel's 6.8, max trap 6.0, Bingo 4.5."

Launch plus 1+55:

Ordinary Pilot: "Here we are at 2000 feet and it's raining like hell. Not a thing in sight. No airplanes, either. We should be at the ramp in 4 minutes. Any lock on the smallboy?"

RAN: "Not a thing."

Concerned Ordinary Pilot: "Okay, keep a sharp eye. I'll make a 12-mile circle. They can't be too far away . . . boy, it's raining hard; viz is zilch."

End of Circle:

Very-Concerned-Ordinary Pilot: "To hell with this, we're going back on-top. Try to raise someone on the radio. What's the heading to bingo? . . . Our state's 4.9."

RAN: "Okay, take up heading 235. We should be about 150 miles out . . . Hello Birdfarm, this is

Concerned 01 . . . we've lost all navaids. Over . . . guess they didn't hear us. . . . Hello Birdfarm, this is . . . etc. . . . etc."

Less-Than-Ordinary Pilot: "Okay, we're at angels 20, heading 235. State is 3.8 . . . Hello *anyone* this freq, do you read? Over."

Fuel Truck 610: "Hello Concerned 01. I'm trying to raise the ship, do you want an ADF steer from me?"

Scared Pilot: "Affirm. Ten second key, please . . . dammit, it's on the blink, too . . . No joy, fuel truck. Can you get homeplate to turn on TACAN? . . . I'm squawking emergency."

RAN: "Hey, I've got a lock-on but the needle's on the nose, and the DME is increasing. Uh, oh, unlocked."

Scared-As-Hell Pilot: "Oh, no! We've got homeplate and smallboy both on the same TACAN channel. Let's switch to guard and try to get a radar steer from *anybody!"*

Fuel Truck: "Concerned 01, what's your heading? I'll try to intercept you."

Mortified Pilot: "Rog. Heading 235, angels 20."

Friendly-NATO-Radar Operator: "Concerned 01, I have you heading for good bingo . . . continue heading 235 . . . 200 miles."

Mortified Pilot: "Two . . . uh . . . *two hundred? . . . (oh God, why me?) . . . Fuel Truck, did* you copy? My state is now 1800. I'll never make it without you.

Fuel Truck: "Rog, keep driving. I'll try a D.R. intercept. My ADF is down also and radar is bad."

Irrational Pilot (now talking to himself): "I can see it now . . . a long green table . . . 9 million bucks in the drink . . . why me? *Why me?*"

RAN: "What's our state?"

Near-Insane Pilot: "1000 lbs! We can't even make land!"

Fuel Truck: "Concerned 01, I've got you in sight. Check your 10 high. I'm streamed and ready."

Relieved Pilot: "Tallyho! Hurray! Probe coming out . . . okay, we'll have to make this one count. Easy does it . . . contact!"

Fuel Truck: "You're taking fuel. I can give you 2500. Okay?"

Calm Pilot: "Rog."

A Little Later:

Fuel Truck: "Bingo field is 20 miles ahead. Wind is 90 degrees to the duty at 25 knots . . . and it's wet. Can you hack it?"

Pilot: "I don't have any choice . . . this is not my day . . . Hang on everybody, this is going to be thrilling."

Fuel Truck: "We're cleared to land. You take it first."

Again-Anxious Pilot: "Rog . . . Okay, checklist complete . . . threshold coming up . . . touchdown . . . nose on runway . . . 100 knots and easy braking . . . whew! We made it."

This is a true story, written by the aviator to whom it happened. It has happened before and can happen again to the unwary.

The winter weather in the Med is legendary. Anyone who has ever flown there can speak for hours on it. If you're going to be operating in the area of the "Atlantic Fleet Postgraduate School," review your procedures, know your divert fields cold, and guard against being the "Pilot Extraordinary" who, in a short period of time becomes the "Near-Insane Pilot."

Incidentally, at the time of the pilot's scheduled recovery, the ship was 100-foot overcast and ¼-mile visibility, in heavy rain. No one heard the pilot's transmissions except the tanker and the NATO operator.

Fuel + IMC = Caution

IN most aircraft there is a pretty important gage which gives vital information – the supply of petrol on hand. In most aircraft there is also a warning light which, if you forget to look at the gage, glows alarmingly to announce a low supply of go-juice. (Matter of fact, when you get low on fuel it will light up whether you've looked at the quantity gage or not.)

While it's not beyond the realm of possibility that both could malfunction at the same time, it isn't likely; but it can happen. When it does, then the computer between the ears has to be activated. "Natch," if the computer goes sour there's only one thing to worry about and that is, whether the "thingamajig" making all that noise keeps making noise long enough to find an airport or field big enough in which to land.

Of course, in a helicopter the odds are in the pilot's favor because he doesn't need much real estate. It is nice to find a reasonably level area, but not absolutely necessary. Many pilots, for numerous reasons, have landed helicopters in all sorts of places. The machine hasn't looked like much after landing in trees, on slopes, in water, and other sites of similar ilk, but all of those surviving were just plain glad to be breathing.

In some cases, despite the quantity gage, warning light, and fully operating computer, a pilot finds himself in a gray area – neither black nor white. One such gray pilot took off from Point A for Point B with plans to stop enroute for fuel. After landing at the midpoint, and discharging a passenger or two, the purveyor of fuel allowed as how his supply was contaminated. (Now the plot thickens.) The pilot knew he had enough fuel to get to Point B, but not enough to fiddle around. Wouldn't you know what happened next? The weather became a factor. It was IMC, but not impossible (100-foot overcast, visibility ½ to 1½, winds 25 to 30, heavy rain). Next, the pilot became lost (uh-oh) and just as he was about to give up he saw a river, knew where he was, and headed for Point B airport.

If his approach to the airport had been into the wind he'd have been all right. When he came over the fence, downwind, that was when the noisemaker became quiet. Reacting beautifully, the pilot made a running, downwind autorotation landing. Although he ran off the end of the runway, and beyond the overrun, he didn't ding the bird. None of the six people aboard were hurt.

The good Lieutenant apparently let an operational mission override good judgment. He knew that fuel onboard at his enroute stop was minimum, or less, to get to his destination under *VMC flight*. However, launching as he did, *in IMC,* he left the ranks of the good guys in the white hats.

Most anyone could conjure up *certain* conditions, for most flights, that might have dictated press on, but in this case, no dice! If he had been hustling to Point B on an errand of mercy, or to provide fire support to pinned-down friendlies, or to get to the club for a free one before happy hour expired, then one might feel more kindly toward the pilot. The clincher, however, was that when he departed his enroute stop he was *15 minutes from his destination* and had only 250 pounds of fuel aboard!

If the weather was acceptable to the pilot to proceed to Point B, then it must have been good enough for someone to bring him some uncontaminated petrol. *Fuel minimums prescribed in the General NATOPS were worked out carefully, and all pilots must recognize that they are minimums.* Violate them and you are in a heap of "trubs." ◄

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This noise-hazardous-area warning sign has been approved by BuMed for posting in designated noise-hazardous areas with application to noise-hazardous equipment. The signs may be prepared locally. Designation of a noise-hazardous-area, however, requires a survey by competent personnel equipped with sound measuring instruments to determine the risk of loss of hearing. (BuMed Notice 6260 of 28 April 1971 refers.)

Polaroid Sunglasses

A PILOT who experienced a visual illusion, when he had never heard of before, took the trouble to write an account of his experience to the Safety Center. He states that he was wearing both polaroid sunglasses and a clear helmet visor while flying, over the ocean, at low altitude in the late afternoon. The water was exceptionally clear and he could see the bottom. A ship was underway and the forward part of the hull appeared suspended over the bottom. Due to the sun angle, there was no reflection visible from the surface of the water. It was, he says, "disconcerting."

With the polaroid sunglasses removed, the illusion was gone. His question was, "Could any of our unexplained, 'collided with the water' accidents have been caused by this phenomenon?"

"The word should be put out," he adds, "that polaroid sunglasses are great for cutting out glare when fishing but should not be used on overwater flights."

Actually, polaroid sunglasses should not be used on any flights – they are not authorized for aviators. Aviators may obtain authorized sunglasses as listed in NAVAIR 13-1-6.7. The HGU-4/P sunglasses (MIL-G-25948) provide general purpose protection against sun glare. Prescription sunglasses are available through the medical department and are procured in accordance with BUMEDINST 6810.4D.

Qualified aviation personnel will be issued aviation prescription lenses, tinted or clear, in a standard FG-58 flying goggle for compatibility with flight gear when 1) a need for such lenses is determined as a result of a visual analysis and 2) the request is approved by the senior flight surgeon or head of the medical department of a command or other medical facility. Navy sunglasses (lens N-15) permit a transmission of 15 to 21 percent of the available light. These lenses may also be made of a plastic/hard resin and come in prescription/non-prescription, tinted and clear. Effective 31 December 1971, all eyeglass lenses must be made of an impact-resistant material.

There is no way to tell if the above-reported illusion, with polaroid glasses, could have caused some of the unexplained water collisions.

CO_2 Cylinder

AFTER a helicopter ditching, the pilot found that only one side of his Mk-2 lifevest would inflate. Post-rescue investigation showed that the CO_2 cylinder, which had recently been installed, had not been fully seated in the cylinder receptacle.

If you wear a Mk-2 lifevest, be sure the cylinders are screwed *firmly* in place. If they are not

notes from your flight surgeon

secure, the CO_2 cylinder will not be punctured when you pull the inflation toggle. *This can also happen to the LPA-1 and the LPP-1 lifevests.*

RT-60 Radio

A HELICOPTER pilot and copilot down in-country were unable to transmit to the orbiting aircraft on the pilot's RT-60 survival radio because the tone button was in the ON position. The orbiting helo did receive the audible tone from the radio, however, and within minutes, a CH-46 landed and picked up the two men.

Locally, the problem was corrected by a brief from the squadron safety officer on how to use the RT-60. Does everyone carrying this radio in your squadron know how to operate it?

How to Do It

WE hear a lot about what went wrong in the survival episodes after aircraft accidents. Here's an instance of "what went right."

When a CH-46D with four crewmembers and 19 passengers aboard autorotated to the water, all 23 persons exited the aircraft uninjured. The helo sank approximately 30 seconds after water impact.

As soon as the emergency was declared the crew chief personally reinstructed each passenger in water ditching procedures and use of the LPP-1 flotation vest. All emergency exits were opened and each passenger was told which exit to use. The passengers placed their heads on their arms in a crouched position prior to impact.

"The crew chief's thorough preparations and briefing of the passengers for ditching were undoubtedly instrumental in the rapid and highly successful egress and survival phases of this accident," the investigating flight surgeon said.

Overlearning

"THERE's a brief period after a low-level ejection when a pilot, finding himself in the water seconds after saluting the catapult officer, is somewhat stunned," a flight surgeon states in an MOR (Medical Officer's Report). The possibility of this temporary incapacitation, even in the absence of injury is, in his opinion, reason for a helo crewmember to go into the water to determine the survivor's condition and to assist him in rescue procedures.

"To increase his chance of survival," the flight surgeon writes, "a pilot should be able to perform the procedures automatically. This squadron will add a review of postejection procedures to the briefing, which precedes carrier qualifications, so that these procedures will be freshly reviewed when they are most likely to be used. However, no amount of squadron training can achieve the necessary degree of overlearning. This must be a result of *individual* initiative."

During a sudden emergency or in extremely stressful circumstances, behavior tends to shift from skillful, carefully calculated actions, to simpler, well-learned, quickly-executed habits. So say the psychologists.

Each time before you take off, review your emergency procedures. Ask yourself, "What must I do if I have to punch out? Or bail out? Or ditch?" *And be sure you know all the answers!*

Variation in Mk-13 Mod 0 Distress Signals

SEVERAL reports have come in concerning Mk-13 Mod 0 day/night distress signals (Mk-13 Mod 0 marine smoke and illumination signals) which lack the familiar three bumps on the plastic cap of the night end. The caps of these signals do, however, have a flange around the edge which can be used to identify the "night end."

According to the Naval Ammunition Depot, Crane, Ind., the lots containing these flares were produced under Air Force contracts. These were Contract N104-8311A (lots 2-HK-0965-104 through 50-HK-1265-104) and Contract N00104-68-C-3458 (lots 1-KC-0668 through 40-KC-0868 with the exception of lot 35-KC-0868). To insure that all fleet units are informed of the existence of these signals, NAD Crane has recommended to the Naval Air Systems Command that an IAAB (Interim Aviation Armament Bulletin) be prepared indicating the proper means of identifying the night end of these signals and the lots involved. ◄

Cleared Downwind at Angels 'Point Eight'

AN A-7E launched at night from a CVA for a practice CCA/ACLS hop. Reported weather at launch was 1800 broken, 10,000 broken, 25,000 broken, visibility 7 miles.

Shortly after launch, the pilot experienced radio problems. He proceeded to emergency marshall and squawked the code for communications failure. CIC vectored another A-7E (hereafter known as A-7 No. 1) to join the NORDO A-7 (now A-7 No. 2) for a section penetration and approach. After joinup, it was found that the problem was a weak radio and aircraft-to-aircraft communication was possible. However, A-7 No. 1 maintained the lead for the remainder of the flight.

After confirming that the approach was to be a trap for A-7 No. 2, the leader instructed him to dump to landing weight. The approach was normal with the leader dropping the other aircraft above glideslope at about ¾-mile astern of the ship. Overcontrolling a settle in the groove, No. 2 went flat at the ramp and boltered. Shortly thereafter, CCA transmitted, "A-7 No. 2, join up on No. 1, cleared downwind at angels point eight."

The lead continued upwind for 20-30 seconds then started a turn downwind at 1000 feet. After turning about 45 degrees, No. 2 transmitted, "Lost you in the clouds." Continuing his turn, No. 1 began a gradual descent in order to maintain VFR, leveling off at about 600 feet.

Approximately 30 seconds after losing sight of the lead, No. 2 regained visual contact. He advised the leader

Conspiracy Against Helicopter Pilots

NAVY and Marine helicopter pilots who have served one or more tours in Vietnam are quick to remind others that the environment in which they operated would have to be the worst in the world. They can enumerate many times over why the Southeast Asia area is the toughest.

HC pilots who have been on Deep Freeze will dispute, loud and long, the claims of the 'Nam pilots. The Deep Freeze pilots believe their operational environment to be the worst.

HS pilots firmly believe that *all other* helicopter pilots are pampered and really don't know what rugged operations are all about.

SAR helicopter pilots in mountainous regions perhaps may be the most aloof of all. They are positive their lot is solid bottom on the totem pole of preferred environments.

Whichever of these types is right matters little. They are all correct as soon as special consideration is given to one or two conditions. For example, the 'Nam pilot maintains that when Charlie is throwing real, live bullets at you, that is it! Well, say the other types, you learn to adjust, and you certainly don't get shot at on *every* flight. *The key, of course, is learning to adjust.*

From the beginning of his flight training until a pilot steps out of his helicopter for the last time, he is constantly adjusting. His environment is a hostile one. Wind, weather, terrain, bullets, himself, and other people are all involved in a six-way conspiracy against him. Naturally, some, by dint of hard work, hours of study, varied duty, and a smattering of good luck, are able to adjust against the conspiracy. They are called pros. They are the ones who, by word and deed, teach by example, valuable lessons to many others in the adjustment process.

It would be hard to set up one condition as the test of all tests, so we'll lump together several to make

that he was behind and above him. At this, the lead A-7 cautioned No. 2 to watch his altitude, noting that he (A-7 No. 1) was at 700 feet of altitude. Shortly after this, all contact was lost with A-7 No. 2. An extensive search followed but failed to reveal any trace of the missing aircraft. It is presumed that the pilot inadvertently flew into the water.

A thorough investigation was conducted and several firm conclusions reached. One of the conclusions was that the attempted *turning* rendezvous under adverse conditions of darkness and low clouds was a contributing factor in this accident. It was determined that the A-7E NATOPS Manual is lacking in specifics as to procedures for rendezvous in the event of a bolter following a NORDO approach. Accordingly, a proposed change to NATOPS providing for a straight-ahead rendezvous was prepared and submitted by the aircraft accident board. Action on this proposed change is pending.

This accident should serve as a stimulus for all aircraft operators and ships concerned to review their procedures for NORDO approaches, *including* the procedures to be followed in the event of a NORDO bolter. ◄

point. Consider then, being caught day after day in whiteout conditions, or feeling bullets smack into the airframe during a MedEvac flight, or launching for a night dip from a pitching, rolling deck, literally on the pages, or being fragged for multiple predawn searches in the mountains for an overdue aircraft or hunting party.

Each of the above operating conditions requires maximum performance, pilot skill, courage, and hard work to accomplish the mission successfully. It means keen thinking and thorough planning of the flight ahead of time. It means continuous concentration during the flight. It means knowing the pilot limits and the helicopter operational limits and operating up to, but not exceeding, either. It means having a healthy respect for the elements and staying on top of the situation -- keeping everything well-in-hand.

There is a tendency on the part of most helo drivers, when safely away from demanding operating conditions, to become a mite too relaxed. This could be attributed to the belief that nothing back at home could possibly be as demanding as the deployment just completed. Sound familiar?

It's natural that the sudden cessation of daily operations in a hostile environment would cause a letdown once back in the friendly environment of Homeplate. Pressures are less. Schedules are somewhat more relaxed. Weather conditions are better, and who would argue that the importance of a training flight is comparatively low when weighed against an operational mission? Nevertheless, pilots cannot afford to let their guard down.

It is every bit as important to treat a training flight or an administrative flight with the same respect, the same degree of thoroughness, and to be just as alert as you would be for an operational flight. Remember, that the same conspiracy exists no matter *where* you may be flying. If the wind, weather, terrain, or flying lead is not going to cause any great concern, then the odds have been considerably enhanced for safe operations. So automatically, without having to worry about four parts of the conspiracy, you can concentrate against the other two -- you and others. If you, therefore, do something about you, and learn as much as possible about others and what they are *supposed* to do, then the conspiracy becomes easily managed.

Controlling the conspiracy means safer flight operations which means that everyone in the chain from you to the President is happy. And, the chances of getting a four-day weekend with momma and the kids will even make them happy. Now, if the pay raise . . . ◄

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There are Check Rides and...

The TPC (Transport Plane Commander), a Weekend Warrior, was assigned to give the operations officer his last syllabus flight prior to a check ride. The TPC's credentials were impeccable. He was a seven striper – a three striper in the Navy and a four striper with the airline that employed him. He had "many thousand" hours in model. He knew the ops officer well and knew from many conversations that he was a real charger, knew his business and was eager to be designated TPC. The syllabus called for the last instructional flight to be a 3-hour review; it would be a stiff workout for the pilot being upgraded.

The TPC walked into the operations office and said, "Good morning, Harry, I'd like to review your jacket and log book before we brief." The ops officer produced three log books and his jacket. The TPC said, "I'll be in the readyroom if you want me." An hour later he reappeared and asked the ops officer if he was ready to go. The ops officer's face lit up with a SEG (Sly Engaging Grin) as he said, "OK, George, sock it to me."

The TPC suggested that they find a quiet spot where they could discuss the forthcoming flight without interruptions. He then set the stage for the flight with a monologue that went something like this: "Harry, on this flight I want you to assume that I'm a reasonably intelligent copilot. Use me, but I'm not going to volunteer to do anything unless you ask or direct. I will not give you any compound emergencies that will compromise a safe flight, but you can expect plenty of simulated emergencies – engines, instruments, navaids, electrical, hydraulic, and problems with crew and passengers.

If we have a real emergency or a real system malfunction of any kind I'll expect you to handle it, but I'm available for suggestions or ideas if you want to talk it over. I will not intentionally misture any frequencies. When we do basic airwork take your time. All turns will be standard unless I ask you for steep turns; in which case I want not less than 45 degrees nor more than 60 degrees. In holding patterns and on approaches I want you to be as precise as you can. When you taxi I want you to assume there's a little old lady in the back of the cabin, and we wouldn't want to throw her around. Any questions?"

The two pilots then engaged in a lengthy series of questions and answers. Finally, they proceeded to the line shack, looked over the gripes for the past several flights and then departed for the ramp. During the preflight the TPC asked the ops officer many questions concerning the aircraft's systems.

The two then inspected the interior of the aircraft as thoroughly as they had the exterior. The TPC asked

questions about weight and balance, cargo loads, emergency lighting, escape routes, cabin integrity, and crew briefings. He left nothing uncovered. The flight engineer was briefed and the purpose of the flight carefully explained. The checklists were then precisely followed and the engines started. After clearance was received, the ops officer (now pilot-in-command) taxied out.

While taxiing toward the warmup spot, the TPC gave the first simulated emergency when he declared a loss of brake hydraulic pressure. The ops officer was equal to the task and simulated what he would do. As the aircraft swung into the wind for runup and mag check, the TPC threw a brake fire at the pilot. Again, the emergency was handled properly.

The runup was routine and the pilot to be upgraded asked his copilot to get their clearance. He expected an emergency on takeoff and wasn't disappointed. The TPC, right after decision speed was called out, said, "You have a runaway prop on No. 1 engine. What course of action will you take?" The pilot continued his takeoff and ran through the steps of handling the problem.

During the climb, ATC came in with an altitude restriction and holding instructions at an intersection about 15 miles away. While holding, the pilot noticed the plane kept trying to climb. He glanced at his flap indicator and saw the reason. The flaps had bled down a tad. He then asked the copilot to raise them. Before departing the holding pattern the TPC simulated a cabin fire and an electrical fire both of which the pilot handled correctly.

Departing holding the ops officer was advised that No. 2 engine oil pressure was fluctuating and to assume the engine would fail. The ops officer asked for the checklist and No. 2 engine was secured. He then simulated a call to Center advising of their plight and intentions.

The TPC next requested ATC to release them to proceed off airways for airwork. He then gave the ops officer a real workout with turns, climbs, descents, one engine out, both engines operating, unusual attitudes, aircraft clean, aircraft dirty – the whole bag. Finally, the pilot asked the TPC to fly the plane while he took a breather. At this point ATC was called for clearance, and flight was resumed toward their destination. As the ops officer again took control, Center handed them off to Approach. The TPC instructed the pilot to assume No. 2 engine was out as he retarded the power but did not take the engine off the line. The before-landing checklist was covered and all was well except the gear didn't lower. The pilot directed that the hydraulic pump selector be changed, gear handle and bypass valve checked. The gear dropped.

Just when he thought he had it made, he noted the off flag showing on the ILS indicator; however he had already tuned in the outer marker on the ADF, and he announced that they would discontinue the ILS and proceed on an ADF approach. He directed the TPC to advise him of the new minimums and to call off 100 feet above minimums for an ADF approach. The remainder of the approach and landing was uneventful.

During rollout the TPC announced another hydraulic failure and was pleased when the pilot simulated the proper sequence of actions for emergency stopping. They taxied back to the duty runway and spent the next half hour or so conducting crosswind and downwind landings and takeoffs.

The flight back to base was similar to the outbound leg – with more demonstrations being demanded by the TPC and being properly performed by the ops officer. At homeplate he satisfactorily demonstrated three GCAs and was told to head for the chocks. Later that week the check ride proved to be a piece of cake in comparison to the "instruction" he had received from the TPC.

Here were two pros in action. The TPC took the time to review the background and flight jacket of the pilot under instruction. He covered in their briefing, in detail, what they would do and how it was to be done. At no time was safety of flight compromised. Real emergencies were covered as well as simulated emergencies. The TPC indicated the type of performance he expected. The pilot was alerted beforehand and was equal to all occasions. Although he worked harder in the 3 hours than anyone would expect to on any scheduled flight, he demonstrated he knew his plane and procedures, and was ready to be designated TPC.

...there are check rides.

One spring morning a local training flight was set up for an aircraft commander check. The crew of four; check pilot, pilot being upgraded, flight engineer, and cabin attendant manned the aircraft. A briefing on all maneuvers to be performed was conducted and later determined to have been thorough – as far as it went.

Following initial takeoff, the crew flew to a nearby civilian airport where many landings and takeoffs were conducted. After a full stop landing and subsequent taxi back to the duty runway, the check pilot suggested that a short field takeoff be performed. When questioned, the check pilot said, "Hold brakes and add full power, release the brakes, and at 85 knots call for half flaps. Lift off at 90 knots and climb out at 90 knots."

Continued

The aircraft was cleared by the tower for takeoff. The pilot being upgraded then did as he had been told except *he didn't hold the yoke back*. While the throttle was being advanced to about 52 inches, the check pilot diverted his attention to the radio selector box. The tail rose to what one controller in the tower estimated as "about 5 feet above the horizon." The crewman in the cabin saw the props dig into the runway and started forward to tell the pilots. At that moment the check pilot looked up and yanked back on the yoke as the pilot being upgraded retarded the throttles. The tail fell to the runway and the cabin attendant was knocked to the deck and stunned.

Approximately 30 seconds later the crewman recovered and started forward just as the check pilot released brakes and added power for takeoff. The crewman was hurled to the deck again – this time against a bulkhead.

The takeoff was successful, but prop vibrations were severe enough to cause the check pilot to ask for clearance to land. Following engine shutdown, the damage was discovered.

The subsequent investigation disclosed several actions which were not considered professional.

- The pilot being upgraded not remembering to hold the yoke back when adding full power.
- The check pilot's distraction with the radio selector box as power was added.
- Unauthorized maneuver (short field takeoff).
- Poor judgment on the part of both pilots in not clearing the runway in view of the likelihood of the props having dug into the runway.
- Poor judgment in making the takeoff and then circling to land without declaring an emergency.

The contrast in actions by the TPC in both cases was quite different. One recognized the importance of the flight, took it seriously, briefed, and followed a plan to insure the pilot was ready to be upgraded. The other treated the check flight rather lightly, introduced an unauthorized maneuver which had not been briefed, and then compounded the situation by not taking the time to inspect a possibly damaged aircraft before takeoff.

The pilots being upgraded were also quite different. One knew his aircraft and procedures very well. The other obviously was lacking in knowledge by running the engines up without holding the yoke back. A check flight is not the time to be introducing something new. Besides, an unauthorized maneuver is a no-no at any time!

Aircraft commanders frequently have to decide how far to let a pilot-under-instruction go before taking over. One obvious time is when the trainee is

Too Close For Comfort

IN golf circles one of the first lessons in headwork, passed from pros to beginners, is to hit away from danger. If there is a trap or creek on the right the beginner is instructed to hit the ball left, away from danger, allowing the greatest possible margin for error. The same principle applies for helicopter landings and takeoffs aboard nonaviation ships.

The HAC of an SH-3 was instructing his copilot in operations aboard a CRUDES ship after a three-hour SAR flight. The HAC demonstrated two confined area landings and takeoffs and turned over the controls to the copilot. On his first approach and landing the copilot landed well right of center with the starboard main mount on the edge of the landing circle. The pilots exchanged seats while on deck and the HAC briefed the copilot on the danger of any right drift during takeoff. The helicopter was lifted into a hover and a slight right drift ensued. The main rotor blades then whap, whap, whapped the aft gun director handrail. The HAC took control, declared an emergency and landed the helicopter from the hover.

During one's career as an aviator there is not too much time when absolute concentration and precision must be exhibited, compared to total time in the air, but landing aboard a carrier for fixed-wing pilots, and both landing and takeoff in confined areas for rotary-wing pilots is one of those

times. There isn't any pilot, who has successfully completed the flight program, who doesn't remember the hours spent in the training command practicing precision landings. Yet, it is easy to lose the skills and sharpness once away from the discipline of the training command, during transition into fleet models and subsequent operational flying. The real pros, of course, take advantage of every opportunity to maintain those once-learned skills and have them at-the-ready when needed. When the copilot in this instance landed the helicopter to the extreme right of the landing circle there was no margin for error remaining during the subsequent takeoff.

Prior to the takeoff the HAC, who recognized the potential danger, was remiss in his capacity as aircraft commander. He pointed out the dangers of any right drift in his briefing, but merely pointing out the hazards was not enough. To ensure safety of operations he should either have demonstrated the takeoff or been on the controls himself. There is a very fine line between letting a neophyte go it alone and coddling him. Yet, one of the tests of a HAC is the ability to make instant recognition of the need to take over or not take over. Instructors need to be particularly alert to prevent anyone under instruction from painting himself into a corner.

CATS are for the Birds

NOT too many years ago in this country, a man by the name of Igor Sikorsky put together a weird looking flying contraption called a helicopter. Just like the Wright brothers, Igor's flying machine was greeted with guffaws from the doubters. And, like the Wright brothers, Igor had the last laugh when "the thing" was successfully flown.

Since that day, the helicopter has become one of our greatest airborne assets, both from a military and civilian standpoint. The fact that it can be flown forwards and backwards, straight-up and straight-down, and sideways at zero forward airspeed, makes this whirling dervish a most useful airborne vehicle.

With such tremendous versatility and maneuverability, why would someone try to cat a helo from the deck of an aircraft carrier *when everyone knows that cats are for the birds* (fixed-wing types).

Well, to be perfectly frank, no one really did. But, when you first read the ground accident described below, you might get that impression since it was caused by the forward movement of USS Carrier's No. 3 catapult shuttle.

It was late afternoon on a beautiful, balmy day when the SH-3A was landed on the angle deck following an ASW training mission. The *Sea King* was chocked and tied down, and a routine engines shutdown and automatic blade fold were accomplished.

The aircraft commander was the first to exit the aircraft, and the rest of the crew were preparing to follow when the No. 3 catapult shuttle, which was moving forward, struck the starboard main landing gear wheel chock. The tie-downs prevented movement of the helicopter, however, the straining action caused the starboard sponson and strut to collapse. The SH-3A rolled slowly to the right and came to rest on its side. As a result of this mishap, the copilot, both crewmen, and two flight deck ordnance handlers were slightly injured. The aircraft received substantial damage.

Now that you're acquainted with the what, when and where of this mishap, we'll cut you in on the how, who and why of it.

As we stated earlier, the helo landed on the angle deck. It was secured in a spot between the No. 3 and 4 cats with the starboard mainmount resting partially on the bridle arrester track about 15-feet aft of the water brakes. A corner of the starboard wheel chock extended over the edge of the cat track.

The No. 3 cat crew was about to advance the shuttle and commence the postoperative inspection. Three members of the crew were positioned along the cat

track. To make identification easier, we'll use fictitious names for the crew. AN Capone was at the forward end (Bow Safety), ABAN Pelkey was about midway (Weight Board) and ABE3 Williams was aft (Topside Safety P.O.). The fourth member of the crew was the deck edge operator, ABE3 Ellis.

Williams checked the shuttle clear, gave a "thumbs up" and yelled forward, "Watch the shuttle." *All three topside men* checked the track and *thought* the helo was clear. As the shuttle advanced, a large group of squadron personnel began crossing the track. As a result, the cat crew was kept pretty busy shooing these personnel away from the track. When the shuttle approached the helo, Capone and Williams noticed it would not clear the chock and signaled the deck edge operator to suspend the R and T (retract and tension) engine.

Because of the crowd in the area, Ellis did not immediately note the signal. In fact, Pelkey had to run around the helo to attract his attention. Ellis then actuated the R and T suspend switch, but too late to prevent the shuttle from striking the mainmount wheel chock. The starboard sponson and strut then collapsed and the helo rolled over on its side.

Obviously, the cause factor of this accident was failure of the cat crew to positively ascertain that the catapult track was clear prior to giving a clear signal to the deck edge operator. However, there were two other factors which bear mentioning. One is that the number of personnel assisting in securing the aircraft should, in itself, have been sufficient reason to delay operation of the catapult. The second can best be described by using portions of the TYCOM's endorsement to this mishap which follows:

"It is not clear in the accident report which control mode was selected to move the catapult shuttle forward. Statements of catapult personnel indicate that ADVANCE was used vice MANEUVER. The difference between the two modes is speed of shuttle and flexibility of control. ADVANCE is normally a part of the launching sequence and the full stroke takes 10 to 12 seconds. During other than launch mode, ADVANCE is initiated by the console operator from below decks. Once ADVANCE commences, the shuttle can only be stopped by suspending the retraction engine. This operation could result in damage to the retraction engine because the shuttle stops instantly.

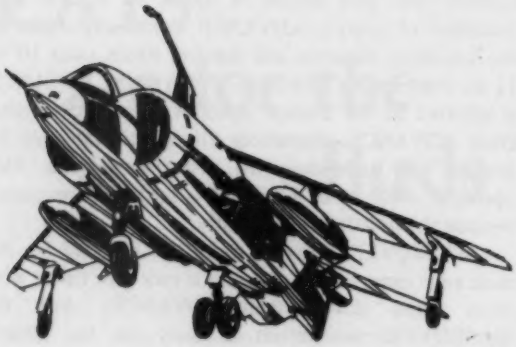
"MANEUVER (forward or aft) is initiated by the deck edge operator and the rate is very slow (more than three times slower than ADVANCE). Also the MANEUVER pushbutton is held in for shuttle movement. To stop operation, the pushbutton need only be released. Had the MANEUVER mode been used, it is unlikely that damage to the helicopter would have been so extensive. Additionally, damage may have been prevented because more time to stop the shuttle would have been available once the dangerous situation was recognized.

"Guidance will be provided by separate correspondence cautioning catapult crews to use MANEUVER to move the shuttle at times other than during normal launching sequences. The use of MANEUVER will especially be stressed when deck conditions are crowded, unless ADVANCE is necessary (such as in maintenance requirements)."

The cat crew involved in this mishap was not green. The waist cat officer stated that they were well-qualified and experienced in observing safety precautions and performing postoperative procedures. He further stated that their departure from a normally cautious approach is inexplicable in view of their past performance.

Why do mishaps like this one continue to occur? In this case there was no reason to hurry the postoperative inspection of the No. 3 cat. The next launch wasn't scheduled until midnight which was 7½ hours away. More than likely, the cat crew was in a hurry to complete any maintenance which might be necessary, and then take a much needed rest before flight quarters was sounded. Unfortunately, their haste led them to be less vigilant, and the unexpected happened.

Working a flight deck is a demanding job which requires optimum output by everyone involved in the many various evolutions. However, speed in itself accomplishes little. Continuous accident-free flight deck operations can only be attained when every member of the team places safety ahead of expediency. *It can be done! Several of our carriers are doing it right now, today!* ◄



WOULD YOU BELIEVE?

NEARLY every conceivable kind of mishap involving personnel working around aircraft has occurred at one time or another. There have been mishaps resulting in personnel injuries from aircraft at rest and moving. There have been mishaps between driven vehicles and aircraft. Personnel have been injured while working on both fixed-wing and rotary-wing aircraft. Now added to the list is a mishap, involving "bravo" injury, between a V/STOL aircraft and a glider tow cable. *A what?* Yes, a mishap involving an ordnanceman caught between a *Harrier* and a glider tow cable.

The pilot of an AV-8A made a hung-ordnance approach with a lateral translation to the dearming area located adjacent to the approach end of the runway. Upon arrival over the dearming area the pilot turned to a southeast heading and landed after having received clearance from the tower for all maneuvers. Two ordnancemen dearmed the rocket pods and the PMBR loaded with practice bombs.

Prior to the *Harrier* landing, a glider had been launched by automobile, in the taxiway – an authorized glider launching area. The glider tow cable had been left across the dearming area while the tow car proceeded to the other end of the taxiway preparatory to returning the tow cable to the west end of the taxiway.

Unknown to the *Harrier* pilot, the ordnancemen, or the operator of the tow car, the force of the exhaust from the *Harrier's* thrust nozzles had caused the tow cable to move from the edge of the taxiway into the middle of the dearming area. When the driver of the tow car was ready to pull the cable, he saw the *Harrier*, well to the right of where he had left the cable, and assumed there was adequate clearance. As the driver began to pull the glider tow cable, it curled around the AV-8A and forced the leg of one of the ordnancemen into the outrigger landing gear wheel. This resulted in his ankle being fractured.

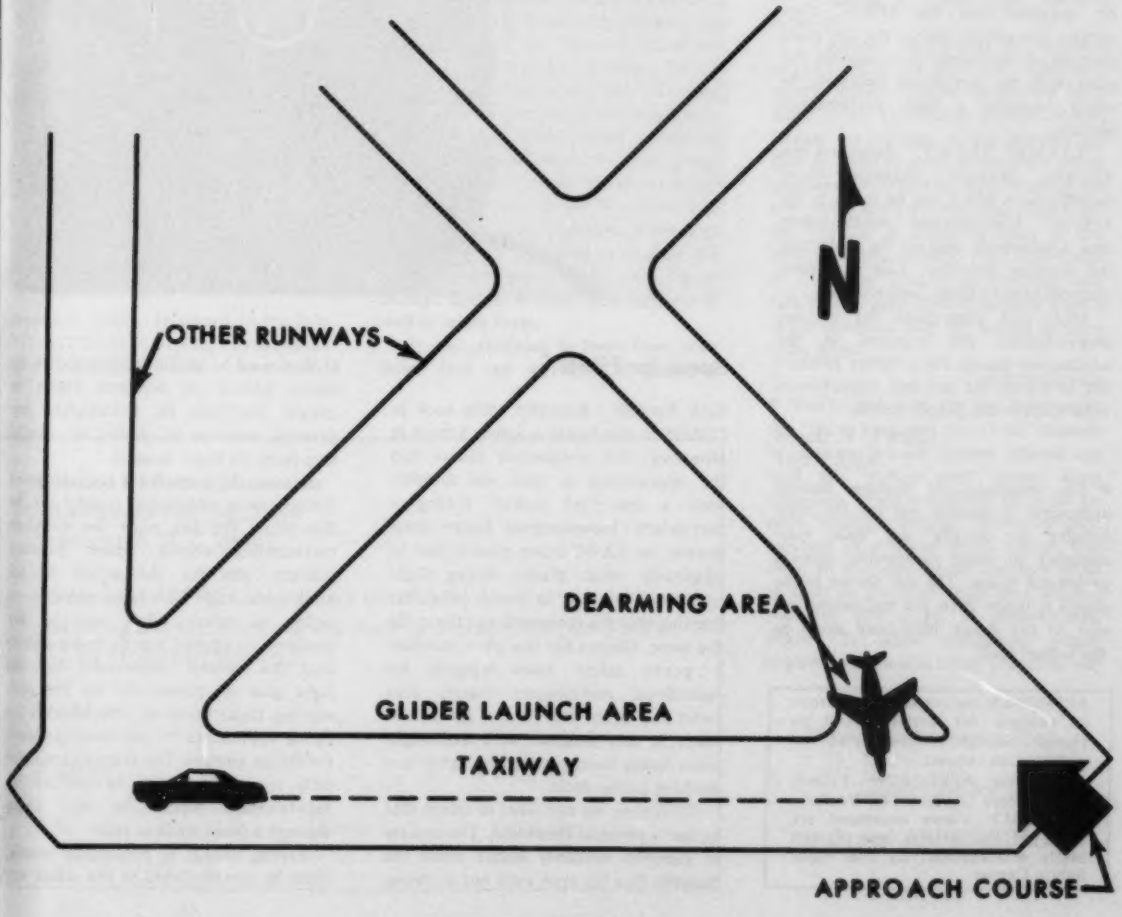
Investigation of the mishap revealed that the glider launching had been conducted in an authorized area. It disclosed also that the *Harrier* pilot had been cleared to land in the dearming area. However, the mishap occurred because of several assumptions:

- Tower personnel assumed the tow car was clear of the AV-8A – and it was, but the controllers didn't know the tow cable had remained in the dearming area.
- The driver of the tow car assumed the tow cable was where he had positioned it and didn't know the *Harrier* had kinked and blown it into the center of the taxiway.

• The *Harrier* pilot was unaware of the tow cable and assumed the area was clear.

• The ordnancemen failed to clear the cable before dearming and assumed it was "just there" and was not in the process of being repositioned by a tow car at the other end of the taxiway.

The board concluded the cause of the mishap to be personnel error. Two completely different types of operations were occurring in the dearming area with inadequate control and coordination. The point, of course, is that although there was no violation of directives, a mishap occurred because of questionable supervision and the absence of prudence on the part of several people. Good common sense plays an important part in the all-important business of safety – by everyone.



The Constellation of Capricorn, according to ancient descriptions and figures.

Letters

You can't lose weight by talking about it.
You have to keep your mouth shut.

Ace L.

Unauthorized Mod

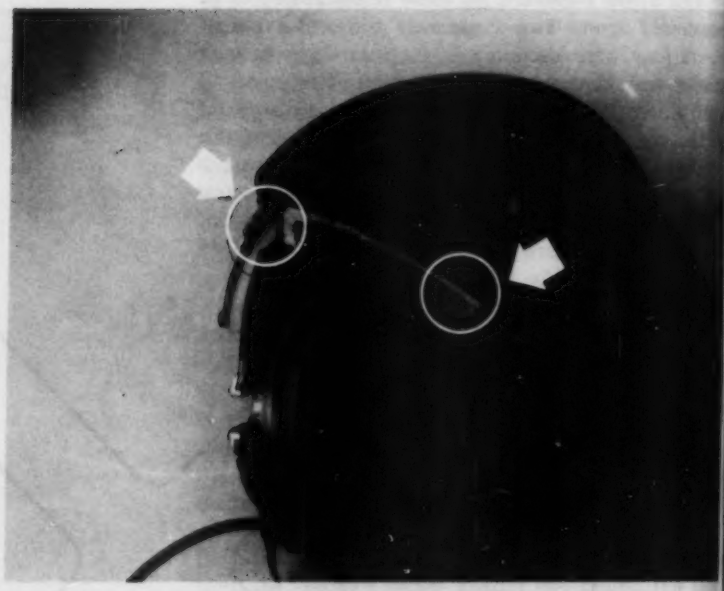
FPO, New York – Recently a new pilot reported to our squadron with the hardhat, an APH-6C, shown in the accompanying photograph. While going through the Advanced Training Command, he was advised by an instructor that the APH-6C unduly hindered proper lookout and that the problem could be partly alleviated by cutting away a section of the hardhat. No question that the APH-6C does restrict the pilot's vision, but the main purpose of the helmet is to provide the pilot with the protection necessary to safely operate a high performance aircraft.

NAVAIR 13-1-6.7, Aviation-Crew Systems Manual, delineates those modifications which can be made to the APH-6C. Unauthorized modifications may substantially degrade the protection the hardhat provides. This is a poor tradeoff to get a little more visibility.

Ideas and suggestions for hardhat improvement are required in the continuous search for a better product but let's leave the test and evaluation of these ideas to the proper people.

LCDR K. W. Huehn
ASO, VA-87

• The Aviation-Crew Systems Manual authorizes a specific cut *on the visor housing* to modify the dual visor assembly in order to improve upward peripheral vision. The cut shown in the photo is larger than the authorized cut and *no cut* should have been made on the helmet itself.



APPROACH welcomes letters from its readers. All letters should be signed though names will be withheld on request.

Address: APPROACH Editor, Naval Safety Center, NAS Norfolk, Va. 23511. Views expressed are those of the writers and do not imply endorsement by the Naval Safety Center.

Specs for Pilots

NAS Norfolk – Recently while back in CONUS at the Aviation Safety School in Monterey, this multimotor aviator had the opportunity to meet and socialize with a few "jet jocks." During a particularly loose-tongued happy hour session, an RA-5C driver related that he religiously wears glasses during flight operations but that he did so only after learning that his commanding officer did the same. Glasses for this pilot provided a great safety asset: bringing his operational environment sharply into focus and often at a time of great need when he was fatigued on a dark night when facing dancing approach lights on a pitching carrier deck.

Of course, no one likes to admit that he has a physical limitation. The aviator in question certainly didn't relish the thought that his eyes were not as strong as they used to be. But realizing that the safety hazard of marginal vision in critical situations far outweighed any personal aversion to glasses, he sought help from his flight surgeon.

At one duty station I had the good fortune to be assigned as copilot for the flag pilot. The flag pilot was truly an outstanding aviator whose primary concern was for the safety of his passengers and crew. In addition to acting as safety pilot, one of my concerns as copilot was to make certain that the aircraft commander had the right pair of glasses set up for each varying flight situation: the bifocals for flying approaches or the reading glasses for flying airways. The flag pilot realized only too well that to be without his aids-to-vision would be like flying through a front without radar.

Flying, which is potentially unsafe, must be accomplished in the safest way

possible – that is, with everything going for the pilot. Little discrepancies such as poor radios, navaids and poor visual acuity usually amount to nothing more than minor aggravations under normal circumstances, but let the weather deteriorate, lose an engine, or throw in a few other thorny variables, and these little bugaboos may well become the very thing your life may depend on.

If you suspect that your vision isn't what it used to be, you may be doing yourself, your squadron and the Navy a big favor if you talk it over with your flight surgeon.

Specsmouse

• Agreed! If you *need* glasses, wear them. If you *think* you may need glasses, check in with your flight surgeon. Our flight surgeon consultant, however, is somewhat bothered by your description of the flag pilot with bifocals. An aviator is permitted to wear glasses and fly, but his lens prescription must fall within the naval ophthalmic standards appropriate to his service group status. Your flag pilot, as you describe him, appears to have ophthalmic deficiencies outside these standards. Perhaps his vision problem calls for examination by an opthalmologist.

Incidentally, as of 31 December 1971, all new glasses will be manufactured of impact-resistant material.

Pyrotechnics

Monterey, Calif. – In regard to the July 1971 APPROACH article, "Pyrotechnic Signals for Pilots," I have one comment which needs to be added. The Mk-79 Mod O illumination signal kit and all *red* tracers, when fired day or night in the vicinity of enemy troops, invariably appear as enemy tracer fire. The consequences could well be fatal.

To my knowledge, all the tracer/signal kits which have been available to pilots in hostile environments seem to have been the type which appear as red tracers. Since, by the very nature of our missions, a hostile environment cannot be ruled out, it would appear wise to concentrate more attention on a signaling device which cannot possibly be mistaken for enemy tracer fire. Until this article appeared, the fact that .38 caliber tracers exist in colors other than red apparently was unknown to most except for NAVORD personnel.

CAPT John Henry Key, USMC
Naval Postgraduate School

• The article was triggered by an Anymouse report which called attention to the fact that there were people in the Fleet who did not know about all the pyrotechnics available to them. APSET (Aviation Personal and Survival Equipment Team) recognized some time ago that red tracers could appear as enemy fire. The Mk-130 series green, yellow and red/green signal cartridges were the answer to the problem. The initial signals were allocated to WestPac units to be incorporated as part of the survival vest gear. Many units drew enough signals to train their aircrews as well as outfit them.

It was gratifying to learn from your letter that our APPROACH article is helping to spread the word on the existence of various pyrotechnic signals for pilots.

Don't Follow My Lead

NAS East Coast – What can be done about the following? Upon return from a local night flight, the pilot downed the F-4 and wrote the following discrepancy: "Fire-warning lite came on bright port eng seven times during flt (obviously element circuitry prob)."

Maintenance troubleshooters discovered that it was not an electrical problem. In fact, the element was operating properly. A blown gasket on the BLC spider valve was allowing hot bleed air to be diverted onto the fire warning element and seven times this warning system tried to tell the pilot that he had a problem. Each warning was disregarded. Fortunately, the pilot was able to return to base upon completion of a normal 2.3 hour flight, *without incident.*

Of interest here is that the afternoon of this flight, the pilot had attended a safety survey critique conducted by a team from the Naval Safety Center. During the critique, it was pointed out that in order to have an effective safety program, the attention must come all the way down from the top. This pilot is not the top but is senior to many of the officers in this activity. It's a little tough to convince juniors to comply with safety procedures and regulations when a senior provides only lip service to these same items.

Concernedmouse

• You've laid it on the line. We thought the "do as I say, not do as I do" attitude of seniors toward juniors phased out with the "yellow peril" many, many years ago. There's certainly no room for such "example setting" in the complex business of aviation safety today. This word to the wise should convince those at fault to consider their own actions, and not just those of subordinates, relative to what constitutes proper implementation of a safety program.

Vol. 17 **approach** No. 7

RADM W. S. Nelson
Commander, Naval Safety Center

Our product is safety, our process is education and our profit is measured in the preservation of lives and equipment and increased mission readiness.

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Credits

This month's cover: A *Phantom* section painted by CDR Floyd Sykes. Photo on p. 14 by PH1 H. Harper. Diagram on p. 45 by Don Lips.

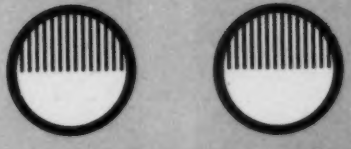
Naval Aviator Number One

THIS month – on 1 January – we celebrate the 58th anniversary of the appointment of Theodore Gordon Ellyson as Naval Aviator Number One. Since that date, countless thousands of others have earned the coveted title of Naval Aviator.

By today's standards, Ellyson's flying career was relatively short. It began on 2 January 1911 when he reported to pioneer aviator Glenn Curtis, in Los Angeles, for flight training. It ended tragically on 27 February 1928 when he was killed in an aircraft accident in Chesapeake Bay during a night flight.

"Spuds" Ellyson's enthusiasm for flying, and his professional performance added immeasurably to the development and growth of the infant Naval Aviation. He was responsible in large part for the dignity and tradition which Naval Aviation enjoys today. His contribution to the science of flying remains an inspiration to all who wear the Wings of Gold.

USE LOW BEAMS



WHEN DRIVING IN DENSE FOG